RD
B685me

The Library
of
Victoria University.

Source Purchase

Accession No. 14,234
Class No.
Book No.

Digitized by the Internet Archive
in 2014

https://archive.org/details/metaphysics00bowuoft

METAPHYSICS

BY

BORDEN P. BOWNE

PROFESSOR OF PHILOSOPHY IN BOSTON UNIVERSITY

REVISED EDITION

FROM NEW PLATES

NEW YORK · : · CINCINNATI · : · CHICAGO

AMERICAN BOOK COMPANY

Copyright, 1882, by HARPER & BROTHERS.

Copyright, 1898, by HARPER & BROTHERS.

All rights reserved.

W. P. I

14,234
26/12/1907

PREFACE

This work is a revision of my earlier work on the subject. For "substance of doctrine" the teaching is the same. The chief changes are in the form and exposition. The fundamental doctrine is more systematically set forth, and is unfolded into more detailed inferences; but the general view is unchanged. In spite of many well-meant critical washings, I still remain wallowing in the ancient metaphysical and idealistic mire, and am even confirmed in my error by further reflection.

The publication of the *Theory of Thought and Knowledge* made it unnecessary to reproduce the epistemelogical matter of the previous editions. Apart from this fact, the most marked feature of the revision is the greater emphasis laid on the idealistic element. This has been made more prominent and more consistently developed. And, on the other hand, it is shown that on the traditional realistic view both thought and being are impossible.

At the same time, I have sought to save idealism from the misunderstandings which are the great source of popular objections to it, and also to make a place for inductive science. This is done by the distinction between phenomenal and ontological reality. The latter belongs to metaphysics and must finally be viewed as active intelligence. The former is the field of experience and is perfectly real in that field; that is, it is common to all and is no individual

illusion. And anything we can do in the way of discovering uniformities of coexistence or sequence in that field is so much clear gain. The discovery of these uniformities is the great work of inductive science; and this study it can pursue without being molested or made afraid by metaphysics. Of course, when the scientist sets up these uniformities as self-sufficient and self-executing laws, he then becomes a metaphysician; and criticism is in its full right when it reminds him that such doctrine is not science but bad metaphysics. But the distinction between phenomenal and ontological reality enables us at once to save the truth of appearances and such science of them as we may have, and also to go behind them to a deeper realm if thought should demand it.

At the same time, it must be noted that the final result is to deprive all concrete science of its absolute character. The successive phases of phenomena cannot be deduced from antecedent phenomena by any proper logical process. In every theory we have to find the ground of the seen in the unseen; and we have no insight into that hidden realm which will lift our concrete science into anything more than a practical expectation which serves for living rather than for speculation. There is an agnosticism which springs from a sensational philosophy, and this can only be viewed as the apotheosis of superficiality. But there is an agnosticism, or anti-dogmatism, which springs from a real insight into the nature of reason itself. This agnosticism is more wholesome, both speculatively and practically, than the crude gnosticism of popular thinking. Such fictitious gnosticism is one great obstacle to progress in the world of thought. It is the prolific source of speculative conceits and of mischievous practical negations; and one of the chief duties of criticism is to show its fictitious character.

The method pursued in the discussion depends on peda-

gogical reasons. A direct abstract discussion would be far shorter and, for the practised reader, more satisfactory. But it would be intelligible to only a few, and they would not need it. For the sake of being understood, to say nothing of producing conviction, it is necessary to start from the stand-point of popular thought and to return to it at each new start. In this way it becomes possible to show the thinker on the sense plane the dialectic which is implicit in his own position, and which compels him to move on if thought is to reach anything sure and steadfast. Unless this method is borne in mind it would be easy to find the discussion in constant contradiction with itself. A great deal of the argument is carried on on the basis of the popular realism, but only for the sake of showing the popular speculator the impossibility of reaching anything final on that basis, and thus preparing him to appreciate the more excellent way. This method involves much repetition, but it is pedagogically necessary in the present stage of speculative development.

That there is a place for metaphysics would be more generally admitted now than when the first edition of the work was published. Then metaphysics was to some a stumbling-block, and to others foolishness, and even a mark of mental degeneration. In King Bomba's army, it is said, a part of the drill consisted in making ferocious grimaces, which were expected to strike terror into the enemy. *Faccia feroce* was the word of command. Many of the opponents of metaphysics would seem to have adopted similar tactics and make ferocious faces whenever the subject is mentioned. But the device is fast becoming ineffectual. There is a growing insight into the fact that metaphysics underlies all thinking and all science. The important factor in both is not the bare fact of experience, but the metaphysical notions whereby we form and interpret experience. Most

beliefs are but implications of a system of metaphysics, consciously or unconsciously held; and they run back to that system for their justification. The great debates of the time are essentially metaphysical. The debaters seldom suspect it; and yet both parties are busy with the nature of being, and with the antitheses of matter and spirit, necessity and freedom, mechanism and purpose, appearance and reality, finite and infinite. The phenomena of the system are the same for all; the dispute concerns their interpretation; and this, in turn, depends entirely upon our metaphysics. And, wittingly or unwittingly, we all have a metaphysics. Since, then, we must use metaphysical conceptions, whether we will or not, it is well to make these notions the subject of a special inquiry, with the aim of fixing their value and significance. This is all the more desirable from the fact that the pretended renunciation of metaphysics always has the practical result of assuming without criticism a very definite system of metaphysics—generally a mechanical and materialistic fatalism. This work is meant as such an inquiry. It is by no means a "mental philosophy," which is the common understanding of metaphysics; it is rather an exposition of our fundamental philosophical concepts, their contents and implications. The clearing up of these concepts is the supreme condition of philosophical progress.

We note this first in cosmology. Every one familiar with cosmological speculation will recognize that the bulk of it has rested upon the crudest possible metaphysical conceptions, and that it would vanish of itself if these conceptions were clarified. Popular theories of evolution, the "new philosophy," etc., operate with vague notions of nature, mechanism, continuity, necessity; and of course the lower mechanical categories are accepted as first and final without the slightest suspicion of their confusion and contradic-

tion when thus regarded. Out of this speculative chaos we can emerge only by subjecting these fundamental notions to a searching criticism.

But the need of this criticism is most marked in psychology. Current psychology, especially of the "synthetic" sort, has erred and strayed from the way, beyond anything possible to lost sheep, because of the unclear or inadmissible metaphysical notions with which it operates. We have, first, an attempt to construe the mental life in terms of mechanism or of the lower categories. This has led to the most extraordinary mythology, in which mental states are hypostasized, impossible dynamic relations feigned, logical identities mistaken for objective temporal identities; and then the entire fiction, which exists only in and through thought, is mistaken for the generator of thought. Here again nothing but criticism can aid us. We must inquire what our "synthesis" is to mean, and what the factors are which are to be "synthesized," and what are the logical conditions of such a synthesis. This inquiry cannot be dispensed with by issuing cards of questions to nurses and young mothers, or by rediscovering world-old items of knowledge by the easy process of constructing new names for them. The dictionary may be enriched in this way, and charming stories gathered concerning the age at which "our little one began to take notice," but this journalistic method is more likely to contribute to the "gayety of nations" than to psychological insight. Neither can we long dispense with the inquiry by the severities of quotation-marks, or by assuming a superior manner and claiming for the new psychology everything in sight. This method also is losing its effectiveness.

The metaphysics and logical structure of psychology are in great need of critical examination. Its practical applications are in equal need of illumination. The mechanical

psychology of sense-bound thought has overflowed, with no small damage, into the field of popular education. In many cases sheer fictions and illusions are taught for truth, or are made the basis of educational procedure. And when no positive damage is done, the result is still barrenness and waste of time. Much of the information given seems to be about on a level with that which M. Jourdain received from his teacher in philosophy. He learned that there are two classes of letters, vowels and consonants, and two kinds of composition, prose and poetry, and that he had been talking prose all his life without knowing it, and that when he pronounced the vowel O he pursed his lips into a circular form, and elongated them when pronouncing A. He also learned how to tell by the almanac when the moon was shining. M. Jourdain was so enchanted with this information that he thought hardly of his parents for neglecting his instruction in his youth, and also gave himself great airs, on the strength of the new education, when he met Madame Jourdain and Nicole, the domestic. Not a little of popular pedagogics is of this barren and inflating sort. Knowledge still puffeth up.

And sometimes the matter is even worse. This thing having become the fad, the intellectually defenceless among teachers and those who would be thought wise are intimidated into accepting it. Hans Christian Andersen's story, a little modified, well illustrates the situation. Two knaves set up a loom in the market-place and gave out that they were weaving fabrics of wondrous beauty and value. To be sure, nothing could be seen; but they set forth that whoever failed to see the goods was thereby shown to be unfit for his place. Accordingly everybody, from the king down, saw the things and praised them; and nobody dared to let on, for fear of being thought unfit for his place. And they bought the goods, to the knaves' great profit, and ar-

rayed themselves, and marched in procession in their imaginary attire. And still nobody dared to let on, until a small boy, of unsophisticated vision, called out: "Why, they haven't got their clothes on!" This broke the spell. Intimidations of this sort are all too common in the pedagogical world at present. And they will remain until an era of criticism sets in. Then we may hope to be freed from the mythologies of the mechanical and synthetic psychology and from the misleading or sterile formulas of popular pedagogics.

For this desirable pedagogical reform, it is necessary that we distinguish more carefully between theoretical and practical psychology. Most theoretical psychology is practically barren. If necessary as a sufficient reason for the facts, it nevertheless often leads to nothing. Power over the facts, whether in education or in society, is not gained by studying psychological theories, but by observation and practice and by experience of life and men. Preparing for an athletic feat by a detailed study of anatomy would not be more hopeless or irrational than preparation for teaching, or for practically influencing men, by a devout study of psychological theory. By insisting on this distinction we shall put an end to the pathetic and costly illusion which has led to so much misdirected and wasted effort on the part of young teachers. And this is to be desired, even if some chairs of pedagogy have to be declared vacant.

My previous work, the *Theory of Thought and Knowledge*, finds its completion in this. The two together give an outline of the problems of speculative thought, and "set forth a general way of looking at things, which, I trust, will be found consistent with itself and with the general facts of experience."

Borden P. Bowne.

Boston, *May*, 1898.

CONTENTS

Page

Introduction 1

Aim and Field of Metaphysics, p. 1; Theoretical and Practical Importance of the Study, p. 2; Relation of Metaphysics to Experience, p. 5; Appearance and Reality, p. 7; Different Kinds of Reality, p. 8.

PART I.—*Ontology*

CHAPTER I

The Notion of Being 13

Different Meanings of Being, p. 13; Pure Being a Logical Abstraction and Impossible in Reality, p. 14; Phenomenal and Ontological Reality, p. 16; Only Active Being is Ontological, p. 17; Doctrine of Inherence, p. 19; Power an Abstraction, p. 20.

CHAPTER II

The Nature of Things 29

Terms Defined, p. 29; Nature not Found in Sense Qualities, p. 31; Herbart Criticised, p. 33; Meaning of Quality, p. 34; Qualities in General cannot Express the Nature of a Thing, p. 36; Nature Found in the Law of Activity, p. 39.

CHAPTER III

Change and Identity 44

Change Defined, p. 46; Being as Flowing Process, p. 47; Attempts to Reconcile Change and Identity: Popular View, Physicists' View, Herbart's View, p. 50; Meaning of Sameness, p. 54; A Changing Thing a Series of Different Things, p. 56; Criticism of

the Heraclitic View, p. 60 ; Irreconcilability of Change and Identity on the Impersonal Plane, p. 62 ; Solution Possible only in Conscious Intelligence, p. 63 ; Intelligence cannot be Understood through its own Categories, p. 66.

CHAPTER IV

PAGE

CAUSALITY 68

Inductive and Productive Causality Distinguished, p. 68 ; Logical Presuppositions of Interaction, p. 71; Popular Explanations of Interaction, p. 74 ; Interaction of Independent Things a Contradiction, p. 79 ; The Interaction of the Many Possible only through the Immanent Action of the One, p. 81; Causality in Succession, p. 84 ; Contradictions in the Idea, p. 85 ; Unity and Causality both Impossible on the Impersonal Plane, p. 88.

CHAPTER V

THE WORLD-GROUND 94

The Infinite not Substance but Cause, p. 94 ; The Finite not a Part or Mode of the Infinite, p. 96 ; Impersonal Things only Phenomena, p. 99 ; The Finite Spirit a Creation, p. 99 ; Difficulties in Pantheism, p. 102 ; The Nature and Purpose of the Infinite the Sole Determining Ground of the Finite, p. 104 ; Truth itself Dependent on the Infinite, p. 107; Nothingness of Non-Theistic Schemes, p. 111 ; Origin of such Schemes in Sense Thinking, p. 113 ; Personality of the Infinite, p. 115.

PART II.—*Cosmology*

CHAPTER I

SPACE 123

Three Views of Space, p. 126 ; Difficulties in Popular View, p. 128 ; Space as Order of Independent Relations, p. 134 ; Space as Ideal, p. 137 ; Misconceptions of the Ideal View, p. 137 ; Objections drawn from Epistemology, p. 149 ; Identity of the Object not Secured by Being in Real Space, but by Being a Factor of the Rational World, p. 152 ; Space of N Dimensions, p. 152.

CHAPTER II

PAGE

TIME 164

No Proper Intuition of Time, p. 164 ; Unclearness of Popular View, p. 167 ; Standing and Flowing Time alike Contradictory, p. 169 ; No Assignable Relation between Time and Events, p. 171 ; Unsuccessful Attempts to Reach Timelessness, p. 175 ; Idealistic View Expounded, p. 180 ; Failure of Ideal View so long as Extra-Mental Reality is Allowed, p. 183 ; Time must be Construed with Reference to Self-Consciousness, p. 184 ; Relativity of Time, p. 188 ; Relation of the Infinite to Time, p. 189 ; Result, p. 193.

CHAPTER III

MATTER, FORCE, AND MOTION 195

Matter, p. 195 ; Plausibility of Atomism, p. 196 ; Source of the Illusion, p. 197 ; Varieties of Atomism, p. 198 ; Strength and Weakness of Corpuscular Atomism, p. 200 ; Force, p. 205 ; Confusion in the Notion, p. 206 ; Laws of Force-Variation, p. 210 ; Action at a Distance both Necessary and Absurd, p. 213 ; Motion, p. 217; Laws of Motion no Necessities of Thought, p. 227; Theoretical Mechanics an Abstraction, p. 241 ; Mechanics only a Science of Phenomena at best, and largely only a Device of Method, p. 241.

CHAPTER IV

NATURE 244

Nature as an Idea of the Reason, p. 244; Nature as Matter and Force, p. 247; Nature as Mechanism, p. 248 ; Complexity and Barrenness of Ontological Mechanism, p. 251 ; Nature as the Order of Law, p. 257 ; Nature as Continuous, p. 263 ; Confusion in the Notion of Continuity, p. 263 ; Continuity of Law the Only Continuity, p. 267 ; Evolution, p. 271 ; Double Meaning of Evolution, p. 271 ; Evolution as a Theory of Causation is Bad Metaphysics Produced by Bad Logic, p. 276 ; Natural Selection, p. 279 ; Nature as the System of Finite, p. 283 ; Natural and Supernatural, p. 285 ; Miracles, p. 289 ; Nature as Idea, p. 294.

PART III.—*Psychology*

CHAPTER I

THE SOUL 299

Meaning of Materialism, p. 300 ; Difficulties of Materialism, p. 303 ;

Monism, p. 314; Difficulties of Monism, p. 314; Psychology of Materialism, p. 316; Epistemology of Materialism, p. 319; Natural Selection as a Principle of Belief, p 321; Kant's Objections to Rational Psychology Considered, p. 332; Scruples Concerning the Being and Identity of the Soul, p. 336; Result, p. 344.

CHAPTER II

PAGE

SOUL AND BODY 349

Interaction of Soul and Body as Concomitant Variation of Both, p. 350; Conservation of Energy, p. 352; Body as Organism, p. 355; Origin of the Organism, p. 356; Mechanism and Vitalism, p. 357; Difficulties in Both, p. 357; A Special Subject Needed for the Apparent Mental Life, p. 367; The Infinite the Source of both Soul and Body, p. 368; The Concomitance of the Physical and the Mental Series not Absolute, p. 370; Origin of Souls, p. 372; Untenability of Traducianism, p. 373; Heredity, its Difficulties, p. 375; The Future of Souls, p. 378; Speculation Destroys Knowledge but Makes Room for Belief, p. 379.

CHAPTER III

OF MENTAL MECHANISM 381

No Mechanical Representation of Mental Activities Possible, p. 383; Difficulties in the Notion of a Mental Mechanism, p. 384; Herbart's View Criticised, p. 388; The English Associationalists, p. 390; Reproduction, p. 391; Memory Explained by Nothing but Itself, p. 393; Cerebral Reproduction, p. 396; Mechanical Explanation in Psychology purely Fictitious, p. 399.

CHAPTER IV

FREEDOM AND NECESSITY 404

Freedom Defined, p. 405; Freedom in Intelligence, p. 406; Significance of Freedom for Science and Philosophy, p. 407; Metaphysics of Necessity, p. 410; Mistaken Notions of Freedom, p. 410; Freedom and Science, p. 413; Freedom and the Law of Causation, p. 414.

CONCLUSION 421

INTRODUCTION

The problems of speculative philosophy may be summed up in two questions: How is knowledge possible? and, What is reality? The former question belongs to epistemology; the latter belongs to metaphysics. The first question has been discussed in a previous volume, the *Theory of Thought and Knowledge*. The second question is now to be considered.

The nature of reality, then, is our subject. But we do not aim at a detailed knowledge of particular things, such as the special sciences might give, but rather at an outline conception of reality, within which all knowledge of particular things must fall, and by which such knowledge must be judged. There are certain general conceptions which make up at once the framework of knowledge and the framework of existence. Such are the categories of being and cause, change and identity, space and time; and our knowledge of particular things will depend on the conception we form of these basal categories. Epistemology has shown them to be principles of thought; metaphysics inquires into their real significance. Our work will largely consist in a study of the ontological meaning of the categories, either in themselves or in their specifications. Thus we mark off our field from that of the special sciences.

The need of the metaphysical inquiry has a double root.

In the first place, the categories are primarily principles of thought. Kant claimed that they are only such principles, and have no significance for reality in itself. In this way he overturned his own system; for reality becomes only a form of words when the categories are denied all objective validity. At the same time, it is clear that there is a great deal that is purely formal and relative in the use of the categories, and that by no means corresponds to any objective fact. We may also be quite sure of the validity of the formal principle, without being clear as to the form in which the principle must be objectively conceived. Thus, we may have no doubt respecting the objective reality of causality or identity, and still be very much in the dark as to the form in which real causality or identity exists. Hence, after epistemology has established the formal principles, it remains for metaphysics to fix their ontological form and significance.

In the next place, these fundamental notions are always loosely and often contradictorily conceived in popular thinking. There is a natural metaphysics in spontaneous thought; but it is not wrought out into any clearly conceived and harmonious system. Our practical thinking is moulded by practical needs; and we never spontaneously give any greater precision to our ideas than practice calls for. Moreover, these ideas, in unreflective thought, largely take their form from our sense-experience, and thus acquire a mechanical and materialistic character. This does little harm while thought remains instinctive; but when reflection begins, and these loose and one-sided notions are taken for the fact, then their parallax with reality is magnified until there results some grotesque absurdity or some pernicious untruth. Then extended matter tends to become the typical and exclusive conception of substance, and mechanical action becomes the sum of causality. The result is a reign

of materialism, or a conflict of science and religion, or some other such unprofitable aberration. These things arise almost exclusively from imperfect conceptions of the categories, and especially from determining their contents by appeals to sense experience.

Thus the metaphysical inquiry appears to be a matter of both theoretical and practical importance. It is theoretically important, in order to escape a shallow dogmatism on the one hand, and a self-destructive subjectivism on the other. It is practically important, in order to lift popular thought from the sense-plane, where it is perpetually tempted to run off into necessity, mechanism, and materialism. The aberrations of philosophy are largely due to misconceptions of the categories; and both the reform and the progress of philosophy depend on a profounder insight into their true meaning and implications.

The question, What is reality? can only be answered by telling how we must think about reality. We have no means of dealing with reality other than through the conceptions we form of it. This fact has led to the sceptical suggestion that we can never tell whether our conceptions correspond to reality. To this the answer is that this "correspondence" is itself a very crude and obscure notion. The only correspondence which our conceptions can have consists in their validity for the things. There can be no correspondence in the sense that we can first know things by themselves, and then form conceptions of the things already known, and finally compare the things and the conceptions in order to note their correspondence. This would indeed be a roundabout way of knowing, and would involve works of supererogation. The validity is the only correspondence, and this can be determined only by the self-evidence or necessity with which the conception imposes itself upon the mind.

Again, the sceptical suggestion is out of place here. Before we can decide whether our thought of reality is valid for reality, we must first find out what that thought really is. We have just pointed out that the natural metaphysics of spontaneous thought is loosely and carelessly conceived. It serves for practical purposes as long as we confine ourselves to the daily round, but it by no means gives us the final results of the reflective and critical reason. Hence, before we raise the sceptical question, we must make a critical study of thought itself, with the aim of clarifying our ideas, adjusting their mutual relations, and determining what the essential utterances of reason are in matters of metaphysics. To consider the sceptical question before making this inquiry is to open the way to endless paralogism and logical inconsequence. And when the final utterances of reason have been reached, if they prove clear and consistent among themselves, and cogent in their evidence, there will be little difficulty in getting them accepted in spite of the sceptic.

What is reality? How can we answer this question otherwise than by opening our eyes and telling what we see? or by looking into experience and reporting what we find? This is a very natural question, and for all those on the sense plane it is decisive. But, at a very early date in the history of reflective thought, it became clear that the conceptions we spontaneously and unreflectingly form are not those in which we can finally rest. If we attempt to rest in things as they appear, we find ourselves involved in all manner of difficulties; and thus we are compelled to revise our conceptions until we make them mutually consistent and adequate to the function they have to perform in our thought system. In this way arises the distinction between appearance and reality, or between things as they appear and things as we must think of them; and thus,

finally, the problem of metaphysics becomes a question for thought, and not one which can be answered by sense intuition.

Nevertheless, the facts of experience furnish the data of the problem. We have no way of creating reality, and we also have no such *apriori* insight into its nature that we can tell in advance what reality must be. Some speculators, indeed, have fancied that some such thing might be possible, but this dream now finds few upholders. We must wait for reality to reveal itself, and our utmost hope is to understand it.

Our method, then, is critical, not creative. Experience, as a whole, is our datum, and the question is, How must we think about reality on the basis of this experience as interpreted by thought? We take, then, everything as it seems to be, or as it reports itself, and make only such changes as are necessary to make our conceptions adequate and harmonious. The reasons for doubt and modification are to be sought entirely in the subject-matter, and not in the possibility of verbal doubt. This method allows reason its full rights, and it also saves the natural sense of reality, which can never be needlessly violated with impunity. We take the theory of things which is formed by spontaneous thought, and make it the text for a critical exegesis in the hope of making it adequate and consistent. The method is one of faith, and not of scepticism.

This thought deserves further emphasis. Oversight of it is at the bottom of the popular notion that philosophy leads to scepticism, and also of the popular scepticism of philosophical conclusions. Neither science nor philosophy denies anything which the senses give; though both find reason for denying that the senses give as much as uncritical thought assumes. Both make the data of the senses a starting-point, and on them they build up a rational system.

But this system is never a matter of the senses, but an inference from their data. Both physics and metaphysics carry us at once into a world of realities whose existence and nature can be assured only by thought. The conclusions drawn in both cases seem monstrous when judged by the standard of the senses; but, then, they are not to be judged by that standard. And, upon reflection, it turns out that the two sets of views are not properly contradictory. The sense view furnishes the data, the rational view interprets them. In so doing it assumes the truth of the sense view within its own sphere. The visible heavens and the astronomical heavens are not in contradiction. The astronomer makes the visible heavens his starting-point, and he finds that they force him to affirm the astronomical heavens. Each view, in its place, is correct, and neither denies the other. But if the rustic should attempt to demolish the Copernican theory by appealing to the senses, no one would pay any attention to him, for every one now recognizes that the senses have no jurisdiction in the matter.

The application to philosophical theory is evident. Here, too, we begin with the data of experience, but we do not end with them. We find ourselves compelled to transcend them by giving them a rational interpretation. And as it is no objection to physics and astronomy that the atoms and the ether cannot be seen, or that the heavens seem to contradict Copernicus, so it is no objection to philosophy that its theories cannot be verified by the senses. If, then, in the following discussions, many things are found which are violent and even monstrous paradoxes, when measured by sense-appearance, the reader is begged to remember that we do not recognize that standard as a measure of rational truth, any more than the physicist recognizes it as a test of his theories. In both cases, if the conclusions are soundly

inferred from unquestionable premises, they must be allowed, no matter what bends or breaks.

But, before going further, this distinction of appearance and reality needs a word of elucidation to save us from falling into a verbal snare. Appearance and reality, phenomena and noumena, are phrases which are often loosely used. Appearance often has the sense of illusion and deception, a fiction of the disordered fancy, or a product of pathological conditions; and this meaning has so infected the word itself that it is difficult to use it without suggesting something of the kind. The very antithesis of appearance and reality seems to hand appearance over to unreality, and thus to brand it as fictitious. The antithesis of phénomena and noumena, because of its connection with the Kantian theory of knowledge, has the same misleading suggestion. The phenomenon is supposed to be something which ought to reveal the noumenon, but instead of so doing hides and distorts it. The noumenon, on the other hand, is something trying to peer through the masking phenomenon, but failing in the attempt.

Now it is plain that in this sense the apparent or phenomenal can lead to no insight whatever. The appearance, as fiction and illusion, can never furnish the premises for valid conclusions respecting reality. The phenomenal, as masking or distorting the noumenal, can never give any insight into the real. There must, then, be a truth in the appearance or the phenomenon, if it is to help us to any knowledge of the real.

The true order is this. The distinction between appearance and reality exists for spontaneous thought only in the form which makes appearance illusion. But as thought becomes reflective and self-conscious, we discover that some elements of experience are given in sense-intuition, and that others are given only in thought. The former we call ap-

pearances or phenomena; the latter we call noumena, and, often, reality. If the term noumenon had not acquired a misleading connotation through its Kantian associations, it would exactly express the antithesis. It is the thing as thought, in distinction from the thing as apparent. Reality is an unhappy expression for the antithesis, for it almost inevitably suggests that the appearance is illusion. But the apparent also is real in a way. That is, it is no illusion of the individual, but is a universal or common element in sense-intuition. As such it is real, in distinction from phantasm and error. But, as being an effect of non-appearing causes, it is nothing substantial and is only apparent. And reality, as the antithesis of the apparent, can only mean the ontological and causal ground of the apparent. As such it can be reached only by thought, but the data for our inference must always be found in the apparent.

We may say, then, that both the phenomenal and the noumenal are real, but they have not the same kind of reality. The noumena are real as having causality and substantiality. The phenomena are not causal or substantial, but they are real in the sense that they are no illusions of the individual, but are abiding elements in our common sense-experience. It is of the utmost importance for understanding the movement of thought that these two senses of reality be kept distinct, and that both be distinguished from illusion and error.

The beginner will get some aid to understanding by reflecting on the established doctrine concerning the sense-world. There is universal agreement among both scientists and philosophers that a large part of the sense-world has only phenomenal existence. When we inquire into the causality and ontological ground of that world, we are taken behind it into a thought-world, and are told that this is the truly real. But at the same time the phenomenal

world remains real in its way. It forms the contents of our objective experience, and is the field in which we all meet in mutual understanding. It expresses, then, a common element to all, and is no private fiction of the individual. Concerning it the proper question is not, Is it real? but rather, What kind of reality does it have?

Let us, then, instead of the antithesis, appearance and reality, or phenomenon and noumenon, rather adopt the antithesis, phenomenal reality and causal or ontological reality; and let the task of metaphysics be conceived as an attempt by a study of phenomenal reality to pass to a consistent and adequate conception of the causal reality. When we study the former we find ourselves unable to rest in it as final; and thus are compelled to pass behind the intuitions of sense to the unpicturable constructions of thought.

We begin, then, with the data of experience and the constructions of spontaneous thought, and ask what changes the reflective and critical reason calls for in order to reach an adequate interpretation. The philosopher has no recipe for creation, and cheerfully admits that, if reality did not exist, he would be sadly at a loss to produce it. Being is a perpetual wonder and mystery, which our logic can never deduce. We aim, then, to tell, not how being exists or is made, but only how we shall think of it as it exists, or after it is made. If we were trying to deduce the world from the absolute stand-point, we might take the high *apriori* road; but as our aim is only to rationalize and comprehend experience, we must begin with experience. And as our most fundamental thought of reality is that it has existence, we begin with an exposition and criticism of the notion of being.

Part I

ONTOLOGY

CHAPTER I

THE NOTION OF BEING

Being, reality, existence, are words of many meanings. In their logical use they are not limited to the substantial, but are affirmed of thoughts, feelings, laws, relations, as well as of things. The thought we think is real, in distinction from others which we do not think, or from others—such as contradictions—which cannot be thought. So, also, we speak of existing laws and relations as real, in distinction from others which, as imaginary, are unreal. Thus it appears that there are various kinds of reality. It is important to keep this fact in mind, and to remember the kind of reality which is possible to any given object of thought. Laws, relations, events, appearances are real, but never in the sense in which things are real. The reality of a feeling is in being felt, that of an event is in its occurrence, that of a law is in its validity. The question which metaphysics proposes is, How shall we think of the reality or being of things? The aim is not to construe or construct existence, but simply to find out what we mean by it, or what conditions a thing must satisfy in order to fill out our notion of being.

And first we must guard ourselves against a logical snare, the fallacy of the class term or the universal. Logically considered, every object is a determination of the notion of being. The category appears alike in all, and the difference and determination are found in the attributes.

Logically, then, everything is an accident of being; it is a determination of the general notion to a particular case by means of some specific mark. Hence it is easy to imagine that there is some element of real being, corresponding to the concept, which is common to all objects, and which, by receiving particular determinations, becomes the particular and specific thing. This is pure being, and, as such, is the necessary presupposition of all definite and particular being.

The fallacy here, though palpable, has been the source of a great deal of speculation. Logical manipulation has been supposed to be the double of an ontological process. The last abstractions of logic have been mistaken for the basal forms of existence, and logical subordination has passed for ontological implication. We borrow from logic a few principles bearing on the matter:

1. Class terms, pure being among the rest, may be valid for reality, but they never can be ontological facts. Only the definite and specific can be real in this sense. The concept, conceived as existing, is absurd.

2. Logical manipulation is formal only, and does nothing to the things. When we gather many individuals into a common class, they remain all that they were before. No identity is created and no difference is abolished.

3. In concrete and complete thinking it is impossible to pass from complexity to simplicity, or from simplicity to complexity, from definiteness to indefiniteness, or from indefiniteness to definiteness, so long as we remain on the impersonal plane.

These principles set the untenability of the notion of pure being, conceived as something real, in a clear light. Pure being is objectively nothing; and even if it were a possible existence, we could neither reach nor use it without bad logic. Only the definite can exist; and only the definite can found the definite. The vast amount of speculation,

ancient and modern, which has resulted from oversight of this principle is a striking testimony to the power of the fallacy of the universal. All the schemes for evolving definiteness from indefiniteness, difference from identity, heterogeneity from homogeneity, are cases of this fallacy; and all the illustrations of the process consist in mistaking indefiniteness for the senses, or with relation to our plans or insight, for ontological indefiniteness in reality itself.

But this result is more negative than positive. We learn that being must be conceived as something definite and specific, but we have no insight into the meaning of being itself. And here it may occur to us that no such insight can be given. Being is a simple idea and admits of no explanation. There is no other or deeper idea by which to define it.

There is something in this, but it is irrelevant to our present aim; for if we allow the claim just made, there must always be some mark by which we distinguish being from non-being, or because of which we declare a thing to exist rather than not to exist. We can form the conception of many things, some of which may exist and some of which may not. What, now, is that mark common to the existent and absent from the non-existent? If we can discover this we shall have, if not a definition of being, at least its essential characteristic.

At first sight this question seems to admit of a very easy answer. Being is what we find given in experience, especially in sense-intuition. All of these things and persons about us are what we mean by being. The mark of being is to be found pre-eminently in sense-phenomena. The real is that which can be seen and touched. But even common-sense would not long be satisfied with this view, for it leads straight to idealism. Common-sense holds that things exist

when unseen and untouched, and that many things exist which can never be seen or touched. Nor would common-sense be content to put the existence even of material objects in their permanent perceptibility by all under the proper conditions. A regular and permanent possibility of phenomena is not what spontaneous thought means by a material object. It holds that perception recognizes rather than makes things, and, hence, that their being is more than their being perceived.

But this only makes it the more important to know what is the distinguishing mark of being. We cannot place it in the presentation, for then we become Berkeleians. The essence of the presentation is to be presented. Its being lies in its being perceived. In what, then, does the being of the thing, which is more than perception, consist? After much casting about in thought, it appears that the distinctive mark of being must consist in some power of action. Things, when not perceived, are still said to exist, because of the belief that, though not perceived, they are in interaction with one another, mutually determining and determined. Real things are distinguished from things having only conceptual existence by this power and fact of action. When this is omitted, the things vanish into presentations; and unpresented things are only the ghosts of possible presentations.

We reach this conclusion as the only means of saving ourselves from Berkeley. We reach it equally by observing the function of the notion. The phenomenal world manifests incessant change and motion, and we posit being as its explanation. We cannot rest in the thought of a groundless show, and we have to pass behind these movements, these entrances and exits, to their abiding ontological ground. We supplement the phenomena by the notion of an agent or agents which cause them. These are the true beings, the

real grounds, in distinction from the phenomenal movement. Thus it appears that we demand of being that it shall contain in itself the ground and explanation of the apparent order. When we grasp this fact it becomes clear that being must be viewed as essentially causal and active; for any other conception makes it inadequate to its function.

The formal or logical category of being may possibly imply nothing beyond itself. But when we ask for the metaphysical significance of the category, it turns out that the notion vanishes altogether, unless it take up into itself the thought of definiteness and the thought of causality. Only the definite and only the active can be viewed as ontologically real.

The great difficulty which common-sense will find in accepting this result lies in its failure to distinguish between phenomenal and ontological reality. This distinction is undreamed of by spontaneous thought, and all the contents of our sense-intuition are viewed as equally real, and as real in the same sense. And among these contents we find a great multitude of objects which are undeniably real, and also undeniably inert and inactive. Neither the notion nor the fact of being, then, has any necessary connection with causality.

This difficulty vanishes when we make the distinction referred to. By common consent, there is a great deal in the apparent world which is no ontological fact. If we allow matter itself to be a true substantial existence, and not merely a manifestation of some basal power, we have to admit that its nature is altogether different from what appears. To begin with, the reality of matter as it appears is a multitude of non-appearing elements, and its inaction is only in seeming. Apparent matter has no true being; the elements only truly exist. And these elements are without the properties of materiality which belong to the mass, but,

by their interactions, they found materiality. Just as the elements of a chemical compound have not the properties of the compound, but produce them, so the elements in general have not the properties of the mass, but produce them. Nor does the mass result from the simple juxtaposition of the elements, as a heap of bricks results from piling single bricks together, but, on the contrary, the relation of the elements is purely dynamic. The solidity of the mass is not the integral of the solidities of the elements, but depends entirely upon a certain balance of attraction and repulsion among the elements. Its resistance to fracture and extension, also, depends not on a rigid continuity of being, but on the attractions which hold the parts together. Hence we may say that materiality is but the phenomenal product of a dynamism beneath it. And in this under-realm, as physics teaches, all is incessant activity. Everything stands in the most complex relations of interaction to everything else. When this fact is fairly grasped, we see that the alleged experience of inactive being turns out to be only an experience of phenomena. Of course no one denies the phenomena of rest and inaction, but physics shows that they are only the phenomenal resultants of incessant basal activities. Equilibrium is balanced action. Rest is the resultant of the conspiring energies of the system. This is the view towards which physics tends, and any other would result in making matter a pure phenomenon. Only on the dynamic theory of matter can the proper existence of matter be affirmed.

But, it will be further urged, surely the law of inertia is one of the best-established laws of matter. All mechanical science is built upon it, and results constantly verify it. This objection, also, is an unfortunate one. It rests upon the etymology of the word rather than a knowledge of its meaning. The doctrine has a double signification. It first denies, not activity on the part of a material element, but

only spontaneity with regard to its own space-relations. An element cannot change its own space-relations without the aid of some other. If at rest, it must remain at rest; if in motion, it must remain in motion, unless acted upon from without. But the law does not deny that a series of elements may, by their mutual interactions, pass through a great variety of changes. Advantage is often taken of the fact that the name, matter, is one, to forget that the thing is many; and thus the conclusion is drawn that the law of inertia forbids any action on the part of the elements. The second factor of the doctrine is, that every material thing opposes a resistance to every change of its space-relations; hence the phrase, force of inertia, which has so scandalized the etymologists. In either sense, the doctrine is far enough from affirming a mere passivity on the part of matter. There is nothing, therefore, in our experience of matter which conflicts with the doctrine that all being is active or causal.

A consideration of these facts will remove much of the paradox of the claim that substantial being, in distinction from phenomenal being, must be viewed as causal.

We have carefully put pure being out at the door, and now it threatens to come back through the window. It will be said that our definition of being is not a definition, but only gives a mark which being must have. But back of the power by which being is distinguished from non-being lies being itself, and we seek to know what this is. The notion of cause admits of analysis into the ideas of being and power, and hence cause is the union of the two. The being has the power, and the power inheres in the being. In reply to this objection, we admit the separation of the ideas in thought, but deny that they can be separated in reality. The attempt to separate them in fact leads to insoluble contradictions, and this shows that the distinction is

a logical one. We have, then, to discuss the metaphysical meaning of inherence.

To the question, In what sense does a thing have or possess power? the common answer is, that the power inheres in the thing. But this merely shifts the problem, for the meaning of this inherence is not clear. Uncritical thought contents itself with a few sense-images, and does not pursue the problem further. Spokes in a wheel, or pegs in a beam, or pins in a cushion, serve to illustrate to careless thinking the nature of inherence. Matter, which to the dragon's descendants is ever the type of being, is not in itself forceful, but forces inhere in it. Thereby matter becomes active, and force gains an object or fulcrum, etc. These forces do all that is done; they found all change, quality, and difference; but the matter is supposed to provide them a resting-place. This is the current conception, and, in some of its forms, it rules most of our scientific speculations.

In this view there is a division of labor in reality. There is one part which simply exists and furnishes the being. It does nothing but be. The activities are next supplied by force or power, which finds in the being a seat, home, fulcrum, etc. We have, then, a certain core of rigid reality, which exists unchanged through the changes of the thing, and supplies the necessary stiffening; and around this we have a varying atmosphere of activities, which are said to be due to force. But it is plain that we have fallen back again into the abandoned notion of pure being. The being does not account for the power. It is a pure negation, and is utterly worthless. The power and the being are in no relation except that of mutual contradiction. The only possible reason which even thoughtlessness can urge for positing such being would be, that power must have some support; but it is plain that this passive negation could not support anything. The force, or power, in such a case would be

self-supporting, and thus we should come to the doctrine often held, that reality is nothing but force. The existence of force would never warrant the affirmation of the forceless, and the forceless could never be viewed as the origin of force. These difficulties serve to show that the distinction between being and force, or power, is only logical.

The truth is, that in this separation between a thing and its power, we are the dupes of language. In order to speak of anything, we must adopt the form of the judgment, and put the thing as the subject and the attribute as the predicate. In this way language makes an unreal distinction between the thing and its attributes, and unreflecting commonsense mistakes the logical distinction for a real one. Indeed, language often makes a distinction between a thing and itself. Thus man is often said to have a mind or a soul. Here man appears as the possessor of himself; and it is not until we ask who this possessor is, and how he possesses the soul, that we become aware that language is playing a trick with us, and that man does not have, but is, a soul. Things as existing do not have the distinction of substance and attribute which they have in our thought. They do not consist of subjects to which predicates are externally attached, as if they might exist apart from the predicates, but they exist only in the predicates. Thus we say that a triangle has sides and angles; but though we thus posit the triangle as having the sides, etc., a moment's reflection convinces us that the triangle exists only in its specific attributes. If we should allow that the triangle could be separated, in reality, from its attributes, we should fall into absurdity. We could not tell how the triangle exists apart from attributes, nor how the attributes are joined to it. Now the distinction between a thing and its power is of this sort. It is perfectly valid in thought, but we cannot allow it to represent a real distinction in the thing without falling back into the notion

of pure being and its attendant difficulties. We come, then, to the conclusion that being and power are inseparable in fact, and that they are simply the two factors into which the indivisible reality falls for our thought. The causal reality cannot be viewed as containing in itself any distinction of substance and attribute, or of being and power. It must be affirmed as a causal unit, and, as such, uncompounded and indivisible.

In further justification of this view, we next point out that the notion of power is, in every case, a pure abstraction, and, as such, is incapable of inherence. What spontaneous thought means by this expression is no doubt true, but the meaning is incorrectly expressed. We speak of the soul, or of the physical elements, as having various powers, and thus the thought arises that these powers are true entities in the thing, which underlie all activity. Accordingly, it is not the elements which attract, but the force of attraction. It is not the atoms which act in chemical combination, but affinity does the work. If a heated or an electric body produces sundry effects, the body itself is not the agent, but heat or electricity is called in. Thus the atom appears as a bundle of forces, each of which is independent of all the rest, but all of which, in some strange way, make the atom their home.

Now this will never do. These separate forces are only abstractions from different classes of atomic action. If there be any atom, the actor in each case is the atom itself, but the atom is such that its activity is not limited to a single direction, but falls into several classes. This fact we seek to express by the notion of separate inherent forces, but these are never more than descriptions of the fact mentioned. When we say that an element has a power of gravity, affinity, etc., we say nothing more than that the element can act in these several ways. The powers

are not separate instruments which the thing employs, but only abstractions from the thing's action. Every act of the atom, in whatever form, is to be attributed to the atom itself, and not to forces in it; and every act of the atom is an act of the entire atom. Any other conception leads to contradiction. And so we come to the conclusion that power in general is not a thing or an instrument, but only an abstraction from the activity of some agent. Hence the question, How can power inhere in being? disappears, because the phrase, inherent power, represents no reality, but only an abstraction. The reality is always an agent. How an agent can be made, we do not claim to know; but it is plain that it is not made by joining the two abstractions of power and pure being. How an agent can act is also unknown; but it is plain that we get no insight into the possibility by positing a rigid core of inert reality in the agent.

Inherence, then, has no metaphysical meaning. The fact is an agent, one and indivisible, and this agent is active through and through. But, to explain the agency, we are not content with the agent itself, but form the abstraction of power, and smuggle it into the thing. When the forms of agency are many, we form a corresponding number of these abstractions, and give each a separate existence in the thing. Then it becomes a tremendous puzzle to know how these powers inhere in the thing, or how the thing can use them without an additional power of using them. The puzzle is solved by the insight that these inherent powers or forces are only abstractions from the activity of the one indivisible agent. The only case in which power is not such an abstraction is where it is used as identical with being, as when we speak of the malign, or heavenly, or invisible powers. Such a use of power, instead of being, has the advantage of escaping the lumpish implications of the latter word; and it might be of use in freeing ourselves from the

bondage of sense-experience to think always of a real thing as a power. In this sense of the word, we should say that all the realities of the universe are powers, and that the phenomenal universe is but the manifestation of hidden powers.

When we form the conception of a possible object, in order to realize it, we have to use the material furnished by the outer world. Then we say the thought is set in reality, or is given existence. In this way, as well as by the fallacy of pure being, we are led to think of a back-lying raw material which is simply real, and which serves as stuff for making things. A great many misread analogies of sense-experience lend themselves to this confusion. Thus finally we reach the notion that things exist by virtue of possessing a bit of this reality. This is just the reverse of the fact. Things do not exist by having a kernel or core of real stuff in them, but they acquire a claim to be considered real through the activity whereby they affirm themselves as determining factors of the system. Their existence is manifested and realized only through their activity. Being and action are inseparable; the inactive is the non-existent.

Hereupon some logical scruples emerge. Thus, it may be asked, must not being exist before action? Certainly, a thing must exist in order to act, but, on this theory, it must act in order to exist, which is absurd. This difficulty rests upon a confusion of logical with temporal antecedence. The postulate of action is an agent, but this agent is not temporally antecedent to the action. Action is a dynamic consequence of being, and is coexistent with it. Neither can be thought without the other, and neither was before the other. Being did not first exist, and then act; neither did it act before it existed; but both being and action are given in indissoluble unity. Being has its existence only in its action, and the action is possible only through the being.

The common doctrine of inherence makes a kind of spatial distinction between a thing and its activities; the objection we are considering seeks to make a corresponding temporal distinction. Both views are alike untenable. Metaphysically considered, being is self-centred activity, without distinction of parts or dates. In our thinking, we separate the agent from the agency, but, in reality, both are posited together; indeed, each is but the implication of the other. We would not accept the scholastic doctrine, that being is pure activity; for the act cannot be conceived without the agent. But we deny that the agent can, in reality, be separated from agency; each exists, and is possible, only in the other.

Another scruple is as follows. The idea of being admits of no comparison. The mightiest exists no more than the feeblest. Nothing can be more real than any other thing; and, in so far as things are real, they are all on the same plane. But if to be is to act, it follows that the most active has the most being. This objection rests on confounding the logical notion with real existence. Whatever falls into a class does so by virtue of possessing a certain mark, but this mark may itself vary in intensity, so that, while all the members are alike in the class, they may yet fulfil the conditions of membership more or less perfectly. Whatever meets certain conditions falls under the notion of being; and, in this sense, one thing exists as much as another. But this does not hinder that these conditions should be fulfilled more or less extensively and intensively; and, in this sense, one thing may have more being than another. Whatever moves at all, moves; and yet it is allowable to say that one thing has more motion than another. Whatever acts, acts; and yet some things act more intensively and extensively than others, and, in this sense, they have more being than others. Indeed, the only measure of being

is the extent and intensity of its action. Being is not measured by yards or bushels, but solely by its activity. All that we mean by saying that the being of God is infinite, is that his activity is unlimited, both in intensity and range. With this understanding, the notion of the *ens realissimum*, which many philosophers, notably Herbart, have found so obnoxious, is both admissible and demanded.

In dealing with detailed objections there is always danger of losing sight of the main points. To escape this, we venture to repeat the argument of the chapter as follows: The notion of being is, in itself, purely formal, and its contents need to be determined. The notion of pure being is rejected, (1) as being only a logical concept, and, as such, incapable of real existence; and, (2) as inadequate to the functions it has to perform. There is no progress from it to definite being, and there is no regress from definite being to it. The notion of passive or inactive being is also rejected as a whim of the imagination, which founds nothing, and falls back into the notion of pure being. Hence, all reality must be causal. But, in the popular thought, reality itself is divided into two factors, being and power. This distinction is only a logical one, and cannot be admitted in reality, without falling back into the doctrine of pure being. Again, in the popular thought, a thing exists by virtue of a certain core of reality which is in it, and which supports the activities and attributes of the thing. We reject this core as a product of sense-bondage, and as accounting for nothing, if allowed. We reverse this popular view by rejecting the notion of a stuff which simply exists, and furnishes things with the necessary reality. For us, things do not exist because of a certain quantity of this reality which is in them, but by virtue of their activity, whereby they appear as agents in the system. How this can be is a question which

involves the mystery of creation or the mystery of absolute being; but creation is not the work of the philosopher. The question we have to answer is, What things shall we regard as existing? And the answer is, Those things exist which act, and not those which have a lump of being in them; for there is no fact corresponding to the latter phrase. Things do not have being, but are; and from them the notion of being is formed. These agents, again, have in them no antithesis of passive being and active energy, but are active through and through. Sense-associations and our own feelings of weariness render it difficult to conceive of active being without a central core of inert solidity on which the productive activity may rest. But we may free ourselves from this result of habit by persistently asking, (1) what reason there is for positing such a core, and, (2) what it could do, if posited.

This view cannot be pictured; it must be thought. Hence it will not commend itself to minds which think only in sense-images. Such minds will find some relief by pondering on the distinction between phenomenal and ontological reality, to which we have referred, and which science, as well as philosophy, increasingly emphasizes. The moment we grasp this distinction the view proposed becomes almost self-evident, for the moment we go behind phenomena we find ourselves in the presence of unwearying energy and ceaseless activity. The confusion of the phenomenal and the ontological realms leads to corresponding confusion in our notion of being and our doctrine of predication.

We make no attempt here to draw the line between the phenomenal and the ontological. We only fix the mark by which the line must be drawn. Very possibly inquiry would compel us to view many so-called real things as phenomena; at present we make no decision. Possibly, also, we may have to transform the notion of causality, and

thus of reality, before we get through. But everything cannot be said at once. As the outcome of the whole discussion, we conclude that every substantive thing, in distinction from both compounds and phenomena, must be viewed as a definite causal agent.

The net result is not great, but it is something; at all events, we are clear of the lumpish notions of being which infest sense-thinking, and which are so apt to give crude thought a mechanical and materialistic turn. Phenomenal reality is revealed in the contents of sense-intuition; but ontological reality can be grasped only in the unpicturable notions of the understanding. Its nature is a problem for thought, not for sense. We must rise from the world of lumps into the world of energy.

CHAPTER II

THE NATURE OF THINGS

In the previous chapter we have sought to show that being does not exist, but that certain specific things, or agents, are the only realities. Being is only a class-notion, under which things fall, not because of a piece of existence in themselves, but by virtue of their activity. The conclusion reached was, that the universal nature of being is to act. But this conclusion determines the nature of things as distinguished from non-existence only, and not as distinguished from one another, or as capable of their peculiar manifestations. The present chapter is devoted to a discussion of nature in the latter sense.

This which we call the nature of things has been variously denominated as the essence, the what, or the whatness of things; and all of these terms refer not to the external properties of things, but to some inner principle, whereby things are what they are. But, whatever the term, the idea is entirely familiar to our spontaneous thinking. We believe that everything is what it is because of its nature, and that things differ because they have different natures. There is one nature of matter and another of spirit. There is one nature of hydrogen and another of chlorine. But we are not content with simply affirming the existence of such a nature; we also seek to know what it is. The nature of a thing expresses the thing's real essence; and we hold that we have no true knowledge of the thing until we

grasp its nature. What is the thing? and what is its nature? are identical questions. The doubt of scepticism most often expresses itself by questioning whether the true nature of things does not lie beyond the possibility of knowledge. Such is the theory which we all spontaneously form. It may be that a consideration of the problem of change and becoming will compel us greatly to modify our doctrine of things; but for the present we allow that things exist in the common meaning of the word, and ask how we are to think of their nature or true essence. What is the general form which our thought of a thing's nature must take on?

An answer results directly from the conclusions of the previous chapter. We there found that activity is the fundamental mark of all being. Whatever truly exists, whether matter or spirit, must be viewed as essentially active, and as differing, therefore, only in the form or kind of activity. The so-called passive properties of things all turn out, upon analysis, to depend on a dynamism beneath them, and leave us only an agent in action. But, in order that being should be definite, this activity must have a definite form or law. Activity in general, like being in general, is impossible. It is merely the logical notion, from which the specific determinations which belong to every real activity have been dropped. Now this rule or law which determines the form and sequence of a thing's activities, represents to our thought the nature of the thing, or expresses its true essence. It is in this law that the definiteness of a thing is to be found; and it is under this general form of a law determining the form and sequence of activity that we must think of the nature of the thing.

But when we say that things differ only in the form or kind of activity we are not to conclude that they all have

a common being, for this would be a return to the notion of pure being. We are incessantly tempted to think of a kind of raw material, which, by receiving different determinations, becomes different things, and we must guard ourselves against the seduction. Things exist only in their activities, and have no being apart from them. They are, in brief, concreted formulas of action. But this conclusion is so remote from our ordinary modes of thinking that we must, by a criticism of other conceptions, show that we are shut up to it.

The first thought of common-sense in this matter is to find the nature of things in their sense-qualities. Accordingly, when we ask what a thing is in itself, common-sense enumerates its sense-qualities. Vinegar is sour, aloes are bitter, sugar is sweet. But a moment's reflection shows the invalidity of this crude conception. To begin with, it applies only to sense-objects, while the notion of a nature applies to all being. In the next place, sense-qualities never reveal what a thing is, but only how it affects us; and now we know that sense-qualities are purely phenomenal, and have no likeness to anything in the thing. There is neither hardness in the hard, nor sweetness in the sweet; but certain things, by their action on us, produce in us the sensations of hardness or sweetness. Again, things are in manifold interaction with one another; and this interaction, also, is an expression of their nature. This fact renders it strictly impossible to find the nature of things in their sense-qualities, or to tell what things are by enumerating their sense-qualities. Things have much more to do than to appear to us.

Moreover, even crude common-sense finds reason in experience for changing its views. The same thing is found to have different sense-qualities. The vinegar, which is sour, is also colored, fluid, heavy, etc. But these qualities

are incommensurable among themselves; so that, if one is supposed to reveal the nature, the others do not, unless we suppose that a thing has as many different natures as it has sense-qualities. In that case, a thing with various qualities would not be a unit, but a complex of things. But this supposition so clearly destroys the unity of the thing that it has never been held by common-sense. Thus the attempt to find the nature of a thing in its sense-qualities shatters on its inner contradiction. If the assumption of a thing distinct from a complex of phenomena is to be maintained, the nature of that thing cannot be found in any or all of its sense-qualities.

This fact led speculators, at a very early date, to adopt another view, according to which the thing retreats behind the qualities, as their support, and the qualities appear as states of the thing. The essence is no longer revealed in the qualities, but is their hidden and mysterious ground. The thing is no longer colored, extended, etc., but is the unreachable and unsearchable essence which appears as such. Thus we are on the highway to agnosticism and scepticism. The thing in itself has retreated from sight, and reports its existence in manifestations which, after all, do not manifest. And, since the manifestations are all that is immediately given, there seems to be no longer any ground for affirming that dark essence which can never be reached. This notion of a thing with various and changing states is the foundation of most of our spontaneous metaphysics, and of very many of our philosophical puzzles. Like the notion of inactive being with inherent forces, it is an attempt to solve some of the most important problems of metaphysics. The value of the solution will come up for future discussion. The notion is of interest, as showing that the human mind has recognized the problem and has attempted a solution.

Two views have resulted from the need of putting being back of its apparent qualities, instead of finding it in them. The first is, that being, in itself, is without quality of any sort; the second is, that being has qualities, but what they are is entirely unknown. The first view is our old friend, pure being, back again. Being is the ground and support of the definite qualities; but in itself, as the unmanifested reality, it is without quality altogether. This view we have sufficiently discussed in the previous chapter, when speaking of pure being and of inherence. That which is without quality of any sort can found and support nothing. The formless clay, which we mould into form, is itself a perfectly definite compound of definite elements, and it is susceptible of being moulded only because of its definite and peculiar properties. The formless nebula, which condenses into a solar system, is indefinite only in seeming. The reality is a host of definite elements, with definite laws, and in definite relations of interaction with one another. The chemical elements have not, indeed, the qualities of their compounds; but some qualities they must have to make the compounds possible. Neither oxygen nor hydrogen has any of the properties of water, but both must have fixed properties of their own in order to produce water.

The second view has been more definitely formulated by Herbart than by any other philosopher; but the majority of agnostics would accept it in one form or another. Herbart held that the nature of being is unknown, but that, whatever it may be, it falls under the notion of quality. There is some simple quality, x, which, if we could only reach it, would fully and truly express the nature of the thing. In our sense-experience we never press through to the realities of things. Our experience is of compounds and their qualities; but we cannot doubt that the realities them-

selves have qualities which found those of the compounds. Herbart escaped the difficulties involved in the plurality and incommensurability of sense-qualities by viewing things as they appear, as only complexes of phenomena, and by denying plurality of qualities to the real. These conclusions he reached by a very ingenious, but highly artificial and unsatisfactory, theory of knowing, in which he constantly confounds the independent something in sensation with absolute being. In his theory, every real thing is simple, and its true nature is expressed in some simple quality. This quality is not an effect, like sense-qualities, but reveals the essence of the thing. How this can be we may understand from the Cartesian doctrine of attributes. According to Descartes, the attribute expresses the essence, and tells what the thing is in itself, and apart from all else. So the universal attribute of matter, and hence its universal essence, is extension. The essence of mind is thought. Each of these attributes tells, not what its subject does, but what it absolutely is. Of course, Herbart did not accept these results, but he held to the notion that some unknown quality exists which expresses the nature of its subject as completely as Descartes thought that extension expresses the essence of matter.

But, to make this doctrine clear, the meaning of quality must be explained. If by quality only kind be meant, the statement that the nature of everything falls under the notion of quality is a pure tautology, for quality is taken to mean nature. The word is often used in this sense. When we say that all being must have some quality, we mean only that all being must have some definite nature, or be of some definite kind. If this were all Herbart meant by quality, it was not necessary to insist upon it, and he might have confined himself to affirming the simplicity of being. But qualities fall into two classes, those which are discerned in

intuition, and those which are reached by reasoning and comparison. The former class comprise adjectives and the abstract nouns founded upon them; and it is this class from which the notion of quality is originally obtained. There is, too, a sense of reality in an intuition which no amount of reasoning can ever produce; and there is also an apparent entrance into reality when it is revealed in our senses which we never enjoy in thinking. Hence, when we allow that our senses cannot attain to the true nature of reality, we still cherish the hope that there may be a supersensible intuition possible to other beings, and perhaps to ourselves in some other life, which shall reveal things as they are. In our experience of color, fragrance, and harmony, we enter into their inmost nature, and are conscious that there is no back-lying color or tone "in itself" which refuses to come into knowledge. It never occurs to us to think of the color we perceive as the hiding of another color, which remains forever invisible. Such spectres haunt thought, but not intuition. And so, whenever we conceive of a state in which we shall know things as they are, we always retain this feature of intuition in opposition to reflection. Qualities, then, may express some possible intuition, or they may express a complex of relations. Herbart seems to have understood them in the former sense, for in the latter they are incompatible with the basal conceptions of his system. He views his elemental beings as simple and unrelated. Each one has a simple and self-centred existence, and hence cannot have qualities implying relation and complexity. Our senses do not reveal the true nature of things, but only the effect upon us. We say the thing is hot or cold, sweet or bitter, black or white, etc., but none of these things express more than subjective effects, which are referred to some objective cause. But there is some unknown sense which, if we had it, would reveal the thing as it is in itself. In

that case, the nature would be revealed in intuition, and not in reflection.

But, however this may be, neither adjectives nor abstract nouns are capable of expressing the true nature of things. We have already pointed out that changeless things will not account for phenomena; and qualities, in this sense, are essentially changeless. They may come and go, but their content is invariable. Red may give place to black, but red cannot change to black. We say that things change their color, but never that one color becomes another. Common-sense, therefore, has always put change in things, and never in qualities. The latter never change, but are exchanged. As Plato taught, things may glide from the realm of one idea to that of another, but the ideas themselves are fixed in their contents and mutual relations. Thus they constitute a realm apart from all change, and in this realm alone could Plato find the fixedness which is demanded by knowledge. It was this constancy of the ideas with which he refuted the Sophists, who sought to draw all things and truths into perpetual flow. If, now, we are to view the nature of things as expressed by a quality of the kind in question, we must bring the thing under this notion of simplicity and unchangeability, and thereby we should make it incapable of explaining change, and hence inadequate to the demands upon it. We should fall back into the Eleatic doctrine, which excludes all change from being, or we should have to affirm a doctrine of absolute and groundless becoming, and deny the existence of things altogether. Both of these views will be dwelt upon in the next chapter. Here we point out that no theory which admits the reality both of things and of change can view any simple quality as expressing the nature of a thing.

This fact deserves further consideration. In a perfectly changeless universe, we might think that in some change-

less quality we discern the true nature of things. Even now, when some quality is always present, as the so-called primary qualities of matter, we are apt to view that quality as expressing the essence. But in a changing world things have a past and a future, as well as a present; and these, also, must be expressions of the nature. Yet a present quality, at best, only expresses what a thing now is, and not what it has been or will be. Again, in a dynamic system the essential thing is activity, and the law of this activity, also, must be taken into account. Even the uncritical thinking of daily life recognizes that the same thing may manifest the most different properties at different times, yet without losing its identity; and that very different things may, at times, be indistinguishable by the senses, yet without any approach to identity of nature. It may be that no two things in the universe are alike in all respects, and that the apparent likeness, even of the chemical elements of the same class, is but a parallelism within the limits of observation of essentially different things. The attempt to tell what a thing is by its present qualities would confound such cases. It may be that common-sense is mistaken in assuming identity under different forms, but the same common-sense which affirms the notion of quality also affirms the identity. We must, therefore, try to reconcile common-sense with itself before declaring it mistaken. But if this identity through change is to be maintained, we must, in determining the nature of a thing, take into account what it has been and what it will be; just as, in an equation of a curve, we must know the relations of the co-ordinates not merely for one point, but for all points. Any formula which fails to give this universal relation is not the true equation.

If, then, some quality were present throughout the thing's history, it could not be identified with the nature of the

thing, for the nature must account for the changing, as well as the changeless, qualities. Hence, if we should view extension as an essential quality of matter, we could not regard it as expressing the nature of the material elements; for they, if real, have many other qualities, which must also be founded in the nature; and, besides, extension is an effect, and not a passive quality. In fact, the view we are combating belongs to the pre-speculative period of thinking, when being was viewed as inactive and changeless. Although it was recognized that sense-qualities cannot reveal the essential nature of the thing, still it was conceivable that some occult quality might do so. But as soon as being was seen to be essentially active and changing, this view became untenable. On these two accounts, therefore —(1) the unchangeability of qualities, and (2) the necessary changeability of things—we deny that any simple quality or combination of qualities can ever represent the nature of a thing.

The outcome of the previous argument is, that no intuition or action of the receptivity can reveal the nature of a thing. This nature must forever remain supersensible, and its determination must always be a problem of reason, not of sense. Hence we must give up all attempts to grasp the nature of reality by asking how it looks. The nature can never be expressed by a quality, but only by a rule or law according to which the thing acts and changes. And this conception, in some of its aspects, is entirely familiar to our daily thinking. When water appears now as ice and now as vapor, common-sense never doubts that there is some principle which determines the kind and sequence of these states. Or, when an egg, under the appropriate circumstances, develops through various stages into the typical form, we say that there is a law which determines the form

and sequence of this development; and we should unhesitatingly view the nature of the bird, not as the external product, but as the law by which the development was ordered so as to reach the product. Or, when two or more chemical elements enter into various chemical combinations, and manifest particular properties in each, we say that the nature of the elements determines the result. Again, when the soul runs through various stages, and manifests various forms of action, we say that the nature of the soul determines the form and sequence of these stages. Thoughts, feelings, and volitions are not lawless and unrelated, but their existence and their inter-relations are determined by some one principle, which we call the nature of the soul. We utter, then, no strange thought, but one in perfect accord with daily thinking, when we define the nature of a thing as that law or principle which determines the form and character of its activity.

The objection which common-sense has to making this definition universal arises from failing to distinguish phenomenal from ontological being. Hence, we seem to have abundant experience of inactive and unchanging things, and, hence again, we must not look upon the nature of things as a law of action. But when the distinction is made the difficulty disappears.

But, it may be asked, in what are we better off than before? If then we had to define a thing as that which has certain properties, now we have to define it as that which has a certain law, and thought is in no way advanced. So far as insight into creation is concerned, this is true; but it is not true for thought. The theory which finds the essence of a thing in some simple quality makes no provision for activity and change; or, if it provides for change, it makes no provision for identity. That thing whose nature is expressed now by one quality, and now by another and in-

commensurable one, has no identity with itself. The theory which finds the essence of a thing in a law which governs both its coexistent and its sequent manifestations does make provision for activity, and, in some sense, for identity.

But how, it will be further asked, can a law be the nature of a thing? A law is only a formula in thought, while a thing is a reality. A quality does, at least, represent the way in which a thing appears, or the way in which it affects us. It stands, therefore, closer to the true nature of the thing than a law, which is purely a mental product. If, then, we cannot regard a quality as expressing the nature of a thing, still less can we find in a law the essence which we seek. A law is not, and cannot be, a thing. This objection would have validity against the absolute idealists of the later German philosophy, who identified thought with thing. If it were possible for us to get a perfect formula for the nature of anything, that formula would not be the nature as real, but the nature as conceived. The ineffable difference between a thought and a thing would remain an impassable gulf for human thought. But this is only our ancient admission that we cannot make reality, nor tell how it is made. Hence, whatever the nature of reality may be, whether quality or law, it can appear in our minds only as conceived, and never as the reality itself. And since we can only think about things, not make them, the only possible question is, Must we think of this nature under the form of a quality, or as a law or rule of action? The attempt to think of it as a quality fails, and we decide that the form of our thought must be that of a law of activity. This is the only conception which provides for change and action. The further question, how a law can be set in reality so that, from being a thought, it becomes a thing, involves the mystery of creation, or of absolute being. We do not pretend to know how being is made. We only know

that it is not made by taking an idea and stuffing it with a formless reality. But when being is made, it is simply a concrete formula of action. Care, however, must be taken not to overlook the significance of the term concrete, for it contains that mystery of reality which no thought can ever define.

Without doubt the reader remains unsatisfied, and urges that the being is deeper than the law—that it has the law, follows the law, realizes the law, etc. There is needed a stuff, a raw material of some kind, which is to receive the law and substantiate it. But this is only the old error, and it can be answered only by repeating what we have said again and again. This notion has a certain warrant in our own experience with the outer world. We are not creators, but only users of given material. The notion has a further application to all compounds. These, also, presuppose an antecedent existence, from which they are compounded. But when we apply the theory to a proper reality or agent, we only fall back into the nothingness of pure being. Being could neither have, nor follow, nor realize a law, if the law were not essential to the being, or if the being were other than the realized law. A double temptation besets us here. On the one hand, we are tempted to make the being deeper than the law, and, on the other hand, we are tempted to make the law deeper than the being. In both cases, we mistake the separations of thought and language for separations in the thing. The nature is not in the thing, and the thing does not have the nature. The thing itself is all; and, as it is not compounded of being and power, no more is it compounded of being and nature. The fact is the unitary thing, and this thing acts in certain definite ways. From the fact of activity we form the notion of power. From the form and sequence of the activity we form a rule, which we call the law of its action. But the definite thing is the

only reality; and the distinction of thing and law is in our thought. Being without law is nothing; and law without being is also nothing.

Manifestly this definition of the nature or the essence is purely formal. It tells how we shall think, but never what we shall think. To determine what the nature of any given thing may be, we must fall back upon observation; and, as this can never be exhaustive, we can never be sure that we have an exhaustive knowledge of anything. The manifestations of finite things depend, also, upon their relations to other things, and it is not possible to tell what new properties they might manifest in new relations. It is a common suggestion that the nature of the soul is only faintly revealed in consciousness as yet, and that, therefore, we are the profoundest mystery to ourselves. It is often suggested, likewise, that even the physical elements may have many possibilities which are unsuspected. To overcome this uncertainty, it would be necessary to know the purpose for which the thing exists. If this were possible, we should have an exhaustive knowledge of the thing, and we should know that it would never pass beyond the implications of the purpose. But we have no such knowledge. In our experience, everything seems confined to a limited round of manifestation. Things move in closed curves, and not in open ones. But this may be due to the relative constancy and equilibrium of the conditions in which they exist. All things may be framed for some fixed altitude, and they may be comprised in an upward movement. Leibnitz conceived of all finite reality as called to endless progressive development. Of course, this applies to the physical elements only on the supposition of their reality. But we have not yet sufficiently determined the notion of being to say whether the physical elements fill out the notion of being. If they do, we must allow the possibility mentioned.

Being in distinction from non-being finds its mark in causality. Things find the definiteness which they must have in order to exist at all in the law of this causality. Differing things find the ground of their difference in the different laws of the respective causalities. To know this law is to know the thing in itself, or in its inmost essence. The only insoluble question in such a case is how the law can be set in reality or made substantial; and this question does not belong to human philosophy. It may be that further study may compel us to give up things altogether in distinction from phenomena; but so long as we hold them, we must view them not as picturable objects, but as concrete and definite principles of action.

CHAPTER III

CHANGE AND IDENTITY

The notion of being has already undergone manifold transformations, and the end is not yet. The most prominent factor in the common notion of a thing has not yet been mentioned. This is the element of permanence. We think of a thing as active, but still more as abiding. It has changing states, but nevertheless it is always equal to and identical with itself. The laws of thought themselves seem to demand this, for a thing is nothing for us except as it comes under a fixed idea. We have now to inquire whether this element of permanence can be retained; and if so, how? This introduces us to a problem of a higher order of difficulty than any yet considered.

The source of our puzzles on this point is the fact of change. Change is the most prominent feature of experience, and since we view being as the source of all outgo and manifestation, we must provide for change in being. Otherwise we fall into the Eleatic conception of a rigid, motionless being; and this conception makes being inadequate to its function, and, hence, philosophically worthless. But the admission that we cannot positively describe how a thing is made does not allow us to form a notion of things which shall contain an inner contradiction. The notion that we form must be self-consistent, and must meet the demands of thought upon it. Yet a manifest contradiction seems to exist in the common notion of a changing thing.

This assumes not merely a change, as that *A* should vanish, and *B* take its place, but that *A* itself changes, and yet remains the same. The former conception may be illustrated by a change of color. In this case, one color does not become another, but is replaced by another. The blue does not change to black, but is displaced by black. So with every change of qualities; they are exchanged, but do not themselves change. And no one would think of saying that black can change to white, and still less would one think of saying that, if black did change to white, it would still remain the same black. If one quality should become another, it would change through and through; and we should all regard it as absurd to speak of it as remaining the same quality after the change as before. But why is it any less absurd to speak of a thing as changing, and yet remaining the same, than it is to speak thus of qualities? The latter we never do, but the former we all do. Plainly we have here a speculative problem of the profounder sort, and we must attempt its solution. Can change and identity be reconciled, and if so, how? This is the problem.

This problem is grievously complicated by the failure to distinguish the several meanings of sameness or identity, and by oversight of the distinction between phenomenal and ontological reality. Thus, we may have logical identity, phenomenal identity, and metaphysical identity; and unless we are on our guard it is very easy to confound them. Logical identity is simply the sameness of definition. Phenomenal identity is often the equivalence of appearance, and sometimes it means the continuity of equivalent appearance. Metaphysical identity is quite another thing. It applies to the reality behind the appearance. Without it we lose ourselves in a groundless becoming in which phenomena, which are phenomena of nothing, come and go without any reason whatever. But how metaphysical

identity is to be conceived is a problem of no easy solution. Possibly we shall better work our way into the problem and better understand the course of spontaneous thought by pursuing a somewhat roundabout method and tracing the dialectic of popular thought. This seems pedagogically more promising than a direct and abstract exposition.

But, before attacking the problem, we must define more carefully the meaning of change. Change, in the abstract, may denote any and every change, including the most lawless and chaotic sequences, continuous and discontinuous. In this sense, change would be simply a departure from the present order in any direction whatever. But neither science nor philosophy understands by change a lawless and groundless sequence; for such a conception would make both impossible. Both assume a causal continuity between the successive states of reality whereby each is founded in its predecessor, and, in turn, founds its successor. Both alike exclude the positivistic notion of antecedence and sequence as the only relation between past and future; for this view would reduce everything to an absolute and groundless becoming. In that case, the present would not be founded in the past, and would not found the future. All continuity would be dissolved, and every phenomenon would be a groundless and opaque fact. But even Heraclitus, who first taught that all things flow, and who made becoming the principle of existence, held that the preceding moments in the flow condition the succeeding, and that the course of the flow is subject to inexorable necessity; something as we might say that the laws of mechanics rule the ongoings of the physical universe. Fixity in the flow, marking out its channel and determining its bounds, was to him as prominent a principle as the flow itself. No more does the scientist or philosopher regard change as groundless; it must have both law and ground. Hence it is not a change of

anything into everything, but the direction of change, for everything is fixed. For physics we might formulate the doctrine of change as follows: A given element, A, may, under the proper conditions, pass into A_1, A_2, A_3, etc.; and, by reversing the conditions, we may pass from A_3 back to A again. Likewise another element, B, may, under the proper conditions, run through the series B_1, B_2, B_3, etc. C may pass through the series C_1, C_2, C_3, etc. From any member of the series, as a base, we can pass to any other, by properly arranging the conditions. But, throughout this process, there is nothing lawless and groundless. A can pass into A_1 only under some definite condition, and cannot pass into anything else under that condition. Hence change, in its scientific and philosophic sense, implies causal continuity of being, and is identical with becoming. The past founded the present, and the present founds the future, but everywhere there are ground and law.

The demand for permanence in being and the necessity of recognizing change and providing for it in being have resulted in two conceptions of the basal reality. At an early date the Eleatics defined the basal principle as being, which they viewed as unitary and changeless existence. They thought under the law of identity and provided for permanence. At about the same date Heraclitus defined the basal principle as becoming, which he regarded as a continuous process. He thought under the law of connection and sufficient reason and provided for change. For him nothing ever is in the sense of a fixed existence, but only in the sense of a continuous becoming. The process alone abides; its phases, which we call things, are forever coming and going. This view has had such influence in philosophy that it deserves further exposition.

The Heraclitic conception of being as a flowing process may be illustrated by the case of variable motion. In this

case, the moving body never has a fixed velocity for any two consecutive moments, but is constantly acquiring one; and we measure its velocity at any instant by the space it would pass over in the next moment if its velocity should instantly become uniform. Now at any indivisible instant the body has a fixed velocity, but this fixed velocity is incessantly changing to another. We might say, therefore, that the velocity never is, but perpetually becomes. Again, a point moving in a curve has a fixed direction for only one indivisible instant—that is, for no time; but we define its direction to be that of the tangent-line to the curve at the point, and instant, of measurement. For purposes of calculation, we say that the point moves in a straight line for an infinitesimal distance, but, in truth, the point never moves in a straight line. Now, in this case, we must say that the point has a fixed direction only for an indivisible instant. Any direction which it may have at any instant is incessantly giving place to another. We may say here, again, that the direction of the point never is in the sense of enduring, but is forever becoming.

This illustrates the conception of being which rules in the system of becoming. Nothing is in the sense of enduring, but is always becoming. There are perpetual coming and going; and as soon as a thing is, it passes, and gives place to its consequent. All being is comprised in an order of antecedence and sequence; and the antecedent must yield to its consequent, which, in turn, becomes antecedent, and likewise passes. There is nothing fixed but law, which determines the order and character of the flow. Even when there is seeming fixedness, as when A remains A, instead of passing into A_1, A_2, A_3, etc., thus producing the appearance of change—even this is not to be viewed as an exception to the universal flow of being, but is to be regarded as a continuous reproduction of A, so that the series is as

real as in the other cases; only being of the form A, A, A, there is no appearance of change. The A, in this case, is like a wave where two currents meet, or like a musical note. Both appear constant only because they are incessantly reproduced. Or it is like the flame of a lamp when undisturbed. It seems to be a resting thing; but it is only the phenomenon of a continuous process of combustion. We call it a thing, while it is really a process. In the case of the changing velocities, no one of them abides; that which is permanent is the order of change itself. So, in the doctrine of becoming, the process alone is permanent. The forms of the process, which we call things, are forever coming and going.

Many have sought to find a contradiction in the notion of becoming, but they fail to notice the continuity and universality of the process. Of course, if we affirm a permanent and changeless substratum in being, there is no difficulty in showing that change cannot be combined with such a factor. But the disciple of Heraclitus denies the existence of any such factor. For him, all is changing, except the changeless laws of change. If A becomes A_1, the objector conceives A as first ceasing to be A, and then, after a void period, becoming A_1. Such a notion of change would, indeed, be absurd; but the Heraclitic holds no such view. He holds that A does not first cease to be A, and then become A_1, but it ceases to be A in becoming A_1; and it becomes A_1 in ceasing to be A; just as a body with variable motion does not first lose one velocity and then acquire another, but it loses one in acquiring another. The losing and the acquiring are the same fact seen from opposite sides. So, also, the ceasing of A and the becoming of A_1 are the same fact seen from opposite sides. Seen from behind, it is the ceasing of A; seen from before, it is the becoming of A_1. Now it is only in this sense that change implies that

A is both A and A_1 at the same time. There is no indivisible instant in which A rests as both A and A_1, but one in which A ceases to be A and becomes A_1; precisely as a moving point never moves with two velocities in the same direction at the same moment; but, in an indivisible instant, it ceases to move with one velocity and begins to move with another. But the fact that the one indivisible flow divides itself for our thought into two factors—a ceasing and a becoming—involves no more contradiction than the fact that the same curve is both concave and convex when seen from opposite sides. With this understanding of the doctrine of change or becoming, we return now to the problem with which we started: Can change and identity be reconciled; and, if so, how?

The Eleatics denied the possibility of reconciliation. Either, they held, excludes the other; and as being was the exclusive category of their system, they denied the reality of change. This view has been partially reproduced in modern times by Herbart. The Hegelians, also, have held to the necessary contradiction between change and identity, but only with the aim of illustrating their principle, that all reality consists in the union of contradictions. All definite existence, in their view, is formed by the union of being and non-being. The solution of the difficulty furnished by spontaneous and uncritical thinking consists in the notion of a changeless thing with changing states or changing qualities. These change, but the thing remains constant.

We have in this popular view a division of labor similar to that in the popular conception of being. There we had a rigid core of duration, which simply existed and supplied the being. In addition to this, there was a certain set of forces, in somewhat obscure relations to the being, which furnished the activity. Here we have the same core of

duration, which provides for the identity, and a swarm of conditions, states, and qualities, which look after the change. The identity is located in the core of being, and the change is attributed to the states and qualities. Without doubt, the children of the dragon's teeth will find in this view the final utterance of reason and an end of all discussion; but, still, we must insist that this conception of the changeless thing with changing states is only a spontaneous hypothesis of the mind, whose adequacy to the work assigned it must be inquired into.

A moment's reflection serves to show the untenability of this popular view. A state of a thing is not something externally attached to the thing, but is really a state of the thing, and expresses what the thing is at the time. Any other conception throws us back into the external conception of inherence, which we have rejected, and makes the thing useless as an explanation of its states. For, if the thing itself does not change in the changes of its states, there is no reason why the states should change, or why their changes should follow one direction rather than another. The thing itself must found and determine its changes, or they remain unfounded and groundless. But, to do this, the thing itself must undergo an essential change; for if A remain A, instead of becoming A_1, there is no ground why any of the manifestations of A should change. The external change must be viewed as the external manifestation of an internal change. A change between things must depend upon a change in things. Now when we remember that the only reason for positing things is to provide some ground for activity and change, it is plain that the changeless core is of no use, and must be dropped as both useless and unprovable. It will, indeed, go very hard with the dragon's children to give up this core of rigid reality, but even they may free themselves from the delu-

sion by persistently asking themselves what proof there is of such a core, and of what use it would be, if it were there. There is no help for it; if being is to explain change, change must be put into being, and being must be brought into the circle of change. In what sense a thing remains the same we shall see hereafter; here we point out that it is impossible to reserve any central core of being from change, but being must be viewed as changing through and through.

Another attempt to solve the problem differs in word rather than in meaning. This theory assumes that things, in themselves, are changeless, but their relations change, and thus there arises for us a changing appearance, which, however, does not affect the underlying realities. This is the common view of physicists. It resolves the phenomenal world into an appearance, and places a mass of changeless and invisible atoms beneath it. This, like the previous view, is sufficient for practical purposes, but it is equally untenable, for that change of relations must be accounted for. If we conceive these changeless elements in a given relation, A, there is no reason why they should ever pass into a new relation, B. Conversely, if they do pass into the new relation B, this is thinkable only on the supposition of a change in the activity of some or all of the elements; and this, as we have seen, implies a change in the things themselves. Without this admission the relations remain independent of the things, and unexplained by them. It is impossible to find relief in this conception.

The same criticism applies to Herbart's notion of "accidental views" (*zufällige Ansichten*). According to him, the changes of things are only in appearance, and are due entirely to the changing position of the observer. Thus the same line might be a side, a chord, a tangent, a sine, a cosine, or a diameter, according to its relation to other lines, and yet it would be the same line in all these relations.

The relations would be accidental. According to the position of the observer, therefore, the same thing may appear in widely different relations, yet without any change in itself. The change, then, is phenomenal and accidental, rather than essential. But this view, when applied to the external world, is utterly incredible. It denies all change in the substantial universe, and reduces the manifold changes of the system to occurrences in us. But, even if this view were credible, the difficulty would not be escaped, but transferred. Change would be removed from the outer world to the inner; but, as the knowing mind also belongs to the realm of being, and is, indeed, the only being of which we have immediate experience, the difficulty remains the same. Apart, then, from the inherent incredibility of Herbart's view, it fails to meet the purpose of its invention. The same considerations apply to the proposition to view change simply as a succession of phenomena, as when qualities succeed one another, or when images succeed one another on a screen. It may be that the physical world is only a succession of phenomena in our minds; but that succession must be caused by something and perceived by something; and thus the change, which is eliminated from the phenomena, must be found in the producing agent and in the percipient mind. We may, then, locate the change variously, but it is strictly impossible to eliminate change from being, or to reserve any core in being from the cycle of change. We are forced to bring the substances of the universe into the stream of change, and resign them, in some sense, to the eternal flow. Being is process. Things are forever proceeding from themselves, and, in proceeding, they become something else.

But, before going further, some objections must be considered, which have long been struggling for utterance. It will be said that, in the series A, A_1, A_2, etc., A_1, A_2, etc.,

are all states of A, and that A is the same throughout. The answer is, that A_1 is no more a state of A than A is a state of A_1, or of A_2, etc. Which of these forms shall be taken as the base depends upon experience. When a given form is familiar to us, we regard it as the thing, and other possible forms as its states; but, in truth, any one form is as much the thing as any other. Thus we view water as the thing, and speak of ice and vapor as states of water; but, in fact, ice and vapor are no more states of water than water is a state of them. But here it will be further urged that, through all these states, the substance remains the same. It is the same essence of being which appears now as A, and now as A_1, etc. But we have seen, in the previous chapter, that the essence itself is nothing but the concrete law of action, and that there is no rigid core of being in the thing. Hence the identity of a thing does not consist in a changelessness of substance, but in the continuity and constancy of this law.

In further criticism of the objection, we must ask what is meant by sameness; and, for the sake of progress, we venture the following exposition: A, under the appropriate circumstances, can run through the series A_1, A_2, A_3, etc. B runs through the series B_1, B_2, B_3, etc. C runs through the series C_1, C_2, C_3, etc. Now, as long as we remain in the physical realm, these series can be reversed by reversing the conditions, so that from A_n we can recover A. But, in thus reversing the series, provided all the other conditions remain the same, there is a complete quantitative and qualitative equivalence between the members restored in the regress and the corresponding members lost in the progress; that is, A_m will be in all respects the same, whether reached by a progress from A_{m-1} or by a regress from A_{m+1}. The indestructibility of matter means nothing more than the possibility of working these series back and forth without

quantitative loss. When it is made to mean more, it is always on the strength, not of facts, but of some alleged intuition into the nature of substance. Now the only sense in which A_1 is the same as A, or in which the substance of A_1 is the same as that of A, is that A_1 can be developed from A, and, conversely, A can be developed from A_1. There is a continuity between A, A_1, A_2, etc., which does not exist between A, B, and C, and that continuity is the fact that A_1, A_2, etc., can be developed from A, and not from B or C. These, in turn, can only produce B_1, B_2, etc., or C_1, C_2, etc. Without doubt, the disciple of the senses will fancy that there is a core of being which holds A_1, A_2, etc., together, and differentiates them from B and C; but this fancy has been sufficiently considered. Such a core explains nothing to the reason, and is only an embarrassment. We repeat, then, that in impersonal ontology a thing in different states is the same only in the sense of a continuity of law and relation. Absolute sameness or changelessness is impossible in impersonal reality. This conception of sameness is incompatible with change of any kind, and must be repudiated.

But our view of change suggests another difficulty, as follows: If A really becomes A_1, and ceases to exist as A, the unity of the thing seems to disappear, and A, A_1, A_2, etc., appear as different things. This difficulty we have now to consider. The charge that our view cancels the unity of the thing rests upon the assumption that A is composed of A_1 plus A_2, etc. In this case, A would not be a unit, but the sum of A_1 plus A_2, etc. But this view is an error. When A exists, it is simply and solely A, and A_1, A_2, etc., have no existence whatever. A is strictly a unit, but such a unit that, under the proper circumstances, it becomes A_1. A_1, again, when it has become, is the only member of the series which is real. It does not contain A

concealed within itself; it is purely itself. Misled by the Aristotelian notions of potentiality and actuality, speculators have largely assumed that A_1, A_2, etc., exist preformed and potentially in A; but this means only that A is such, not that it will develop A_1, A_2, etc., but that it will develop into them; and when developed into them it is A no longer. In any other sense, potential existence is no existence. We may say, rhetorically, that the oak exists in the acorn; but, in truth, the oak does not exist at all, but an acorn exists. This acorn, however, is such that, under the proper conditions, an oak will be developed. The phrase potential existence is due to an effort of the imagination to comprehend how one thing can develop into another; and the fancy is entertained that the problem is solved if we conceive the future development to be already concealed in the present reality. But, in fact, this view denies development; for, in the case assumed, there is no development, but only a letting loose of potentialities, which are also, and always, realities. Where there is a true development, the thing developed absolutely becomes. Our doctrine of change, therefore, does not conflict with the unity of the thing, for the thing is never A and A_1 and A_2 at the same time, but only some one member of the series, and, as such, is one and indivisible.

But this makes the other part of the objection still more prominent. How can A, A_1, A_2, etc., be distinguished from a series of different things? They do, indeed, follow one another according to a certain law, but each ceases to be when its consequent begins. A_1 is not A, although it is produced from A, no more than ice is water because it can be produced from water. It is not meant that these different things are externally produced, for they really proceed from one another; but when they are produced, they are different things. The members of the series A, A_1, A_2, etc.,

are related as cause and effect, although, by reversing the conditions, any one may be cause and any one may be effect. But there is no reason for affirming any further unity in the series than this; and there is no reason for declaring that they are only different states of one and the same thing. One member is as much the thing as any other, and one member is as much a state as any other. And, since the notion of the same thing in different states is well calculated to mislead us, we point out that, in a system of absolute becoming, this notion of a state is inapplicable. To warrant its use, there must be some permanent factor which can abide through the changes and distinguish itself from them. But in this system there is no such factor. Indeed, the conscious self is the only thing we know of which is capable of having states. It distinguishes itself from its affections, and affirms itself as abiding through them. But, where all is flow, the thing and the state vanish together; and we cannot speak of the next member as a state of the preceding, for the preceding member has disappeared. A permanent factor of some sort is necessary, to justify the conception of one thing with various states; and thus it becomes still clearer that A, A_1, A_2, etc., must be regarded as different things, having no other connection than a mutual interconvertibility according to a certain law, like the various forms of energy.

And here we must say that the conception is sufficient for all purposes of science and daily life. The possibility of working the series back and forth, under definite conditions, without quantitative loss, is all that the physicist needs to know. Whether it be the same substance throughout the series, or substance incessantly reproducing itself according to a fixed law, is quite indifferent to physical science. Doubtless it would not be difficult to find some one with an "intuition" of the absurdity of the latter view;

but intuitions are seldom resorted to, unless argument fails. Certainly no one whose opinion deserves attention will claim any intuition on this point. Thus we fall back again into the doctrine that all things flow. Reality is incessantly reproducing itself, either in the form A, A, A, thus producing the appearance of permanence, or in the form A, A_1, A_2, etc., thus producing the appearance of change; but the flow is as real in one case as in the other. Now in the series A, A_1, A_2, A_3, etc., which is the thing? We cannot make the thing the sum of the series, for that would destroy the unity of the thing, and would imply that all the members of the series co-exist. The truth is, that each member is the thing, whenever that member acts, and the several members are the same thing only in the sense that each may be developed from the other. In any other sense they are different things. Conceived ontologically, everything changes to its centre, and, by changing, becomes something else, similar or dissimilar.

The current notion of a thing, we have said, is that of a changeless substance with changing states. The changelessness we have been forced to give up; and now it seems that we must abandon any ontological distinction between the thing and its states. The same thing ontologically, it would seem, cannot exist in different states, for, in taking on a new state, it becomes a new thing. We may illustrate this view by the conservation of energy as rhetorically misunderstood. In the correlations of energy there is nothing which glides unchanged from one phase to another, but each phase expresses the entire energy as long as it lasts; and when it produces a new phase it vanishes into its effect. Nothing is constant but law and numerical relation. So a thing, viewed ontologically, is identical with its phases while they last, and when it passes from one to another the cause disappears in the effect. We have next to add

that this separation of phases is largely arbitrary. In the series A, A_1, A_2, A_3, etc., any one member is as much the thing as any other; but these members are only arbitrary units in a continuous process, like the moments into which we divide time. Time is not composed of moments, but is strictly continuous. So the process which we call a thing is also continuous, and the sections into which we divide it are only products of our thought. A, A_1, A_2, A_3, etc., are only segments of a process which appears now as one member of the series, and now as another. It cannot be detained as any one, and it no sooner comes than it goes. Being in incessant progress, it forces itself from form to form, nor tarries in one stay. This is the conception of being which rules in all systems of philosophical evolution. Being is perpetual process, and exists only in its incessant procession. Motion and change are omnipresent. Things as they appear are only stages of the eternal flow, or transient eddies in the flood. The incessant weaving is attended by incessant unweaving, and sooner or later all things pass, except the procession of being itself.

This result is in the highest degree paradoxical, and to many must seem absurd. There is no escape from it, however, so long as we conceive the world of things as existing apart from intelligence and founding the world of change. With such a view the world of substances must be brought into the cycle of change and resigned to the eternal flow. Spontaneous thought is very possibly right in demanding permanence and identity, but it is certainly wrong in its way of getting them. It is looking for them apart from intelligence; and these buffetings result. No reflection upon a world of change, according to the law of the sufficient reason, will ever find a world of changeless substances. On this line there is no escape from the Heraclitic flow.

But the Heraclitic must not triumph. For while spontaneous thought cannot find its identities in an extra-mental world, just as little can the doctrine of change be made intelligible without reference to an abiding intelligence. The extra-mental identities are no worse off in this respect than the extra-mental changes. When all things flow and pass, without permanence or identity of any sort, the Heraclitic doctrine is intelligible only because it is false. If being were strictly changeless the illusion of change could never arise; and if all things flowed the illusion of permanence would be impossible. There must be some permanent factor somewhere, to make the notion possible. A flow cannot exist for itself, but only for the abiding. The knowledge of change depends on some fixed factor, which, by its permanence, reveals the change as change. If, then, all things flowed—the thinking subject as well as the object—the doctrine itself would be logically impossible. It is commonly overlooked by speculators that succession and change can exist, as such, only for the abiding. Something must stand apart from the flow, or endure through it, before change can be conceived. Hence, as a matter of theory, we must have, at least, an abiding or permanent knower, to make the theory intelligible; and, as a matter of consciousness, we have immediate experience of such a knowing subject—the conscious self. In what this permanence consists we shall see hereafter.

Thus it appears that the doctrine of the flow of being must be limited by the permanence, in some sense, of the mental subject. Epistemology further reminds us that the flow, if it is to be anything for thought, must be cast in intellectual moulds. A mere flow, external to all thought and expressing no thought, could be no object of cognition, and would indeed be nothing for intelligence. Finally, logic reminds us that formal identity or the fixity of the

idea is the absolute condition of any articulate thought whatever. Hence any change which we can recognize must be subject to these conditions.

With this insight it becomes plain that the question of change and identity must be considered from the standpoint of intelligence, if we would reach any solution. The abstract identity of the Eleatics cannot be found, when we look for it; and the abstract change of the Heraclitics would make thought impossible. And we must also bear in mind the various sorts of identity, which common-sense never distinguishes. For the entire phenomenal world, the similarity and continuity of appearance are the only identity we have any occasion to affirm. For the physical world, the continuity of law and relation are the sufficient identity. These are the only fixed elements we find, and these are all we need. But for the knowability of that world it is necessary that its successive phases shall admit of being gathered up into a law-giving expression which shall express for thought the nature of the thing. In the series A, A_1, A_2, etc., no one member fully expresses the thing, but only the whole series and the law which unites and implies the members. Such a thing, however, is absurd and impossible apart from intelligence, while it is perfectly clear on the plane of intelligence.

We have here an antithesis of the real and the ideal which is somewhat peculiar, and which demands a word of explanation. Commonly by the real we mean the actual, existing apart from the mind in space and time; and by the ideal we mean that which exists only subjectively or in idea. But now it begins to appear as if the idea were needed to constitute and define the real, so much so that the real threatens to vanish otherwise. If we understand by the real that which is in time and has its existence in succession, logic shows that the real cannot be known; for

if A be A only for an indivisible instant, it is not A long enough for us to say anything about it, or to make it worth while to say anything about it. Before we can say it is A, it is no longer A, and thus eludes us altogether.

We must, then, link the successive phases together by some law-giving idea before we can grasp the thing at all. But this idea, on the other hand, is timeless and thus unreal. Without the idea the changing thing vanishes from thought altogether; but it is not immediately clear how the idea can take on the temporal form. The thing exists successively; the idea has no succession in it. We need the full idea to express the existence of the thing, but the existing thing never expresses or realizes the full idea. Common-sense will not allow the idea to be real, and logic will not allow the thing to be real.

There is no way out of this puzzle so long as we try to define reality without reference to intelligence. The difficulty can be removed only as we conceive the idea to be realized successively, or under the temporal form; and to complete the thought, we are thrown back upon the conception of an underlying intelligence which is at once the seat of the idea and the source of the realizing energy. Otherwise we can only oscillate between an impossible realism and an impossible idealism.

With this result reality and identity acquire special meanings. The reality of the thing might mean the temporal manifestation of the productive energy, or it might mean the idea expressed thereby, and identity might mean the continuity of the realizing process, or the oneness of the underlying idea. And this is the view to which we must finally come concerning the reality of all impersonal things. They have their existence through an energy not their own, and they have their identity solely through the intellect which constitutes them identical. This will appear

more fully later on; meanwhile we get a hint of the difficulty in defining reality without reference to intelligence.

The law of the sufficient reason never brings us beyond the continuous in existence. Continuity of some kind is necessary to escape the groundless becoming and the dissolution of both reason and existence. But this continuity in itself makes no provision for knowledge. Something truly abiding must be found, if we are to escape the eternal flow. And fortunately this something is revealed in experience. In personality, or in the self-conscious spirit, we find the only union of change and permanence, or of identity and diversity. The soul knows itself to be the same, and distinguishes itself from its states as their permanent subject. This permanence, however, does not consist in any rigid sameness of being, but in thought, memory, and self-consciousness, whereby alone we constitute ourselves abiding persons. How this is possible there is no telling; but we get no insight into its possibility by affirming a rigid duration of some substance in the soul. The soul, as substance, forever changes; and, unlike what we assume of the physical elements, its series of changes can be reversed only to a slight extent. The soul develops, but it never undevelops into its former state. Each new experience leaves the soul other than it was; but, as it advances from stage to stage, it is able to gather up its past and carry it with it, so that, at any point, it possesses all that it has been. It is this fact only which constitutes the permanence and identity of self.

Here it will be urged that this view is only another form of Locke's theory, which made identity to consist in memory; and as Locke's view was exploded, even in his own generation, our view may be regarded as demolished in advance. The objection to Locke's view is that memory does

not make, but reveals, identity; and, if Locke denied the continuity of being in the sense in which we have explained it, the objection is fatal. Memory does not make, but reveals the fact that our being is continuous. If our being were discontinuous, or if we were numerically distinct from ourselves at an earlier date, memory would be impossible. But we have seen that continuity is not identity. It is itself a flow, and means only that the being which now is has been developed from the being which was. This is all that is commonly meant by identity. But the question we raise is how to bring a fixed factor into this flow, and thus raise continuity to proper identity or sameness. And this can be done only as the agent himself does it; and the agent does it only by memory and self-consciousness, whereby a fixed point of personality is secured, and the past and present are bound together in the unity of one consciousness. The permanence and identity, therefore, are products of the agent's own activity. We become the same by making ourselves such. Numerical identity may be possible on the impersonal plane; but proper identity is impossible, except in consciousness. And that numerical identity is never for the thing itself, but only for the conscious observer.

At first view this position is an extravagant and even absurd paradox; but we must remember that the soul, as substance, comes under the perpetual flow. We are not conscious of a permanent substance, but of a permanent self; and this permanence is not revealed, but constituted by memory and self-consciousness; for, if we abolish them, and allow the soul to sink to the level of an impersonal thing, identity is degraded into continuity, and permanence passes into flow. Consciousness, then, does not simply reveal permanence in change; it is the only basis of permanence in change. Of course, we do not pretend to tell how personality is made; we leave that for the disciple of the

senses. He finds no difficulty in manufacturing a person by simply providing a lump of rigid substance, and then stocking it with divers faculties. But, while nothing can exceed the cheerfulness with which we admit that we cannot construe the possibility of personality, nothing, also, can exceed the stubbornness with which we deny that the rigid substance furnishes the least insight into the possibility. If, then, the idea of being must include permanence as well as activity, we must say that only the personal truly is. All else is flow and process.

These results are so paradoxical, and so easily misunderstood, that a final caution must be added. In general, common-sense understands by identity merely numerical identity, or continuity of being. In this sense we, also, affirm identity, and agree entirely with spontaneous thought. But the question we raise lies inside of this numerical identity. The thing which is thus numerically identical and continuous is itself discovered to be a flowing principle of action; and here our break with the current view begins. Common-sense aims to secure identity in diversity by the doctrine of a permanent or changeless thing with changing states; and this view we have been forced to reject. Change penetrates to the centre of the thing; the only thing which is permanent is the law of change, and even this is largely a logical permanence. Reality, then, is process, and yet not a process in which nothing proceeds; for being itself proceeds, and, by proceeding, incessantly passes into new forms, and changes through and through. If, by being, we mean something which unites identity and diversity, we must say that the personal only is able to fill out the notion of a thing.

Logic shows that thought can deal with the temporal only as it brings it under a timeless idea; and when we inquire how the timeless idea can be set in reality we find only one way. An active intelligence must realize the idea

under the temporal form. But when we seek to understand intelligence itself we find that intelligence cannot be understood through its own categories, but rather, conversely, the categories must be understood through our experience of intelligence itself. Apart from this they are purely formal, or else mere shadows of living experience. Only in the unity of consciousness can the category of unity be realized. In the consciousness of self as identical throughout change we have the only example of identity in change. The conception of a permanent thing with changing states is founded as conception, as well as realized in being, in the fact of the conscious self. Apart from this personal reference, the categories defy all attempts to give them any metaphysical significance. The formal identities of logic are intelligible on their own plane; but the metaphysical identities of things are simply shadows of self-identifying intelligence. Instead, then, of interpreting personality from the side of ontology, we must rather interpret ontology from the side of personality. Only personality is able to give concrete meaning to those ontological categories by which we seek to interpret being. Only personality is able to reconcile the Eleatic and Heraclitic philosophies, for only the personal can combine change and identity, or flow and permanence. The impersonal abides in perpetual process. It may hereafter appear that the impersonal is only a flowing form of activity, to which, because of its constancy, we attribute thinghood, but which is, in reality, only a form of the activity of something deeper than itself. If this should be the case, the conclusion would be that the absolute person, not the absolute being, is the basal fact of existence.

Here we rest the case at present. The question cannot be finally dismissed until the nature of time has been considered. Meanwhile we see that we must have identity and

we must recognize change; and we also see that the two can never be reconciled on the impersonal plane. As abstract principles, change and identity are in mutual contradiction, and they remain so until they are carried up to the plane of self-conscious thought, and are interpreted not as abstract conceptions, but as concrete manifestations of the living intelligence which is the source and reconciliation of both.

CHAPTER IV

CAUSALITY

We have already seen how the conception of the categories in popular thought is confused by the failure to distinguish the phenomenal from the ontological order. The same fact finds further illustration in the case of causality. The popular conception of this category is in the highest degree confused. Minds on the sense plane are prone to conceive efficiency itself in a mechanical and materialistic fashion; and, owing to the confusion just referred to, efficient causes and phenomenal conditions are inextricably mingled. The only thing clear is that causality must be affirmed; but the form under which it is to be conceived, and the place of its location, are left very indefinite. Very much of our metaphysics on this subject has been built up under the influence of our sense thinking; and for such thinking it is always doubtful if anything exists which cannot be sensuously presented. The first step out of this confusion consists in emphasizing the distinction between causality in the inductive sense and causality as metaphysical efficiency.

As a matter of fact, we find that events occur under certain conditions. When the conditions are fulfilled, the event appears. We may call the total group of conditions the cause, and, upon occasion, we may call any one of the conditions the cause. The complete cause, and the only adequate cause, is the whole group; nevertheless, if the group were given with the exception of one member, we

should call that member the cause of the event which would follow its addition to the group. Any event with complex antecedents would have only one adequate cause, but it might also be said to have as many causes as antecedents, for any one of these might, upon occasion, complete the group, and thus be viewed as the cause. This is causality in the inductive sense; it has nothing to do with efficiency, but only with the order in which events occur.

That the study of this order is of the utmost practical importance is plain upon inspection. The chief part of practical wisdom lies in a knowledge of it. The study must be pursued inductively and not speculatively. It can be prosecuted on any theory of metaphysics, and need not concern itself except in the most general way about metaphysics at all. It is to be regretted, however, that the name of causation should be given to these phenomenal relations. It is not necessary; for nothing is in question but the empirical conditions under which events occur. And it is misleading; for no one has yet succeeded in talking long about inductive causation without dropping into metaphysics; while a large number of those who thus talk have simply caught the phrase without understanding it. Striking illustration is found in the case of those psychologists who set out to investigate inductively the interaction of mind and body, and who fail to perceive that, inductively, the causality is mutual. Physical states condition mental states no more certainly than mental states condition physical states. Both alike, then, are causes in the inductive sense. But the investigators soon let it appear that they have some other conception of causation in mind. Accordingly they allow mental states to attend physical states, but they will not hear of their conditioning them. This uncertainty shows that it is possible to learn a phrase without mastering the corresponding idea.

But whatever we call it, it is clear that the inductive inquiry should be distinguished from the metaphysical. The phenomenal conditions under which events occur are quite distinct from the metaphysical agency by which they are brought about; and they may be studied by themselves. By insisting on this distinction we make a field for inductive study unembarrassed by metaphysical scruples; and we also rescue the metaphysical problem from the confusion which results from confounding the phenomenal and the ontological points of view.

Causality, then, in the sense of productive efficiency or dynamic determination, is the subject of the present discussion. As formal category the idea is simple and admits of no definition, but this by no means decides the form in which the concrete category must be conceived. We are, indeed, commanded to look for a causal ground for events; but it might turn out upon inquiry that that ground must be conceived under a volitional form. It might also appear that such phrases as physical, mechanical, material causation are only crude and untenable applications of the causal idea, which vanish before critical reflection, as either empty or inconsistent.

In popular thought causation manifests itself in three great forms, the interaction of things, the determination of consequents by their antecedents, and in volitional self-determination. We examine these in their order.

Owing to the form of our sense-experience common-sense never doubts that we are surrounded by a great multitude of mutually independent things, each of which might well continue to exist if all the rest should fall away. Each has its being in itself and has its own hard-and-fast self-identity and individuality. But common-sense is not long in observing that these things are comprised in an

order of mutual change and concomitant variation. This fact, together with the systematic tendency even of spontaneous thought, soon leads to the conviction that things also form a system, and that the place and functions of the individual are determined by its relations to the whole. But how can things which are mutually so independent and indifferent in their being be brought into any systematic connection? According to common-sense, this is done by interaction. Things are endowed with forces whereby they mutually determine one another, and thus the system of things is founded. In estimating this view we must consider, first, the logical presupposition of any system; secondly, the given facts of experience; and, thirdly, the nature of interaction itself.

In order that any system whatever shall exist for thought, its members must admit of being brought into relations of likeness and difference under the various categories of thought, and of being united into a logical whole. This implies a complex system of logical relations among the members, and a mutual logical dependence. Hence, whatever the dynamical relations of the members may be, or however those relations may be founded, an amenability to thought and to thought laws is implicit in the conception of an intelligible system. For spontaneous thought there is no mystery or wonder here, for the knowability of things is a matter of course. Reflection, however, shows that this knowability is one of the greatest wonders of existence, and that it has complex and far-reaching implications.

Again, a real system, in order to be anything for us, must be a system of law, so that definite antecedents shall have the same definite consequents; and this in turn demands an exact adjustment or correspondence of all the interacting members to all the rest. Otherwise, anything might be followed by everything or by nothing. The whole

system of law upon which science builds is but the expression of this metaphysical adjustment or correspondence. How this correspondence is secured is an obscure enough problem, but the fact must be affirmed in any case as a postulate of all objective science. Every scientific conception of the causality of the system assumes that similar causes must have similar effects, and that there is some fixed quantitative and qualitative relation between the cause and the effect. Under given conditions there can be only one result. To any given action every other element must correspond with a fixed reaction. But if this is to be the case, then everything must be adjusted to every other in an exact and all-embracing harmony.

But this general commensurability and adjustedness of things, while a pre-condition of system, founds none. It determines the possibility of combination rather than its actuality. In the case of a conceptual system, two things are necessary: first, the commensurability of the contents of the conceptions themselves; and, secondly, the unity of the thinking mind. The mind must comprise the many conceptions in the unity of one consciousness, must distinguish, compare, and relate them, and thus unite them into one systematic whole. The unity of the thinker is the supreme condition of the existence of any conceptual system.

But in popular thought things are not in our minds, nor, for that matter, in any mind. They do not form a conceptual system, but a real system apart from all mind. And thus it becomes a problem to know what it is in the real system which takes the place of the unitary thinker in the conceptual system, and makes the concrete system possible. If we confine ourselves to the hard-and-fast individuals of popular thought, we reach no system, but only an aggregate, and even this exists only for the observer. If the real system were founded and maintained by a supreme thinker,

we should have the necessary bond, and one analogous to the bond which we have in the case of the conceptual system. But this view is altogether too airy for common-sense. The true systematic bond of things is the fact of interaction.

The fact itself is, for spontaneous thought, beyond all question clear; but the clearness is illusory. It arises from the superficiality of sense-thinking and the confusion of the phenomenal and the metaphysical points of view. For untutored thought things are undeniably given as separate individuals in space; and all the reality there is is there in plain sight. By and by an order of mutual change and concomitant variation is discovered, and this awakens the demand for causation; and as there is nothing in sight to play the part of cause but the things of sense-perception, very naturally they are intrusted with the rôle. And all of this is formally correct. There is a demand for causation, and spontaneous thought affirms it. The mutual changes among things demand a causal explanation; and spontaneous thought finds it in their interaction. But the critical doubt concerns not the reality of causation in the case, but its form and location. It may be that the physical is only phenomenal, and that its causality is not within it, but behind or beneath it. Common-sense is quite right in demanding a causal ground for the reciprocal changes of things, but one may still doubt whether its theory of that ground be correct.

And this brings us to the second point mentioned some pages back, the facts of experience in what we call interaction. The fact is that we have no proper experience of interaction whatever. It may be thought that, in the case of volition producing physical motion, we have immediate experience of interaction between the soul and body; but this is a mistake. All we experience is that, upon occasion

of a specific volition, certain physical changes occur, but of the nature of the connection we know strictly nothing. To be sure, the physical state does not enter, except as a sequence upon the mental state; but why the one should be followed by the other, or what the nature of the bond may be, is as unknown as in the case of gravitation. We are often misled, at this point, by our sense-experience. We imagine that we feel our own power flowing over upon the body and controlling it. A certain sense of effort manifests itself, and we seem so to permeate the body that our own spiritual force comes in contact with the reality. But the sense of tension and effort in the muscles, in such cases, is but the reaction of the organism against the volition, and has merely the function of teaching us how to measure our activity. In itself, the will is as boundless and as passionless as the conception, and when the limits of physical possibility are reached it is not the will which has failed, but the machine. That in the physical world we have experience only of mutual change or of antecedence and sequence is too plain to need more than mention. Interaction, then, is a thought problem rather than a datum of experience.

We come now to consider the various conceptions of interaction with the aim of showing that this which we call interaction is not something which takes place between things as independent agents, but rather something which takes place in things as dependent on one fundamental reality. How, then, can things, conceived as mutually independent, interact—that is, mutually determine one another?

The answers given to this question by popular thought are such only in appearance. For instance, it is said that a thing transfers its state or condition to the thing acted upon, and this transference is the act. But this notion is

due to hopeless bondage to the senses. It is simply one of the spontaneous hypotheses of common-sense, and gives a little comfort to the imagination. Action is conceived as a thing which may be passed along from one to another. But when this view is taken in earnest it meets at once the fatal objection that states, conditions, and attributes are nothing apart from a subject. As such, they admit of no transference. The adjective is meaningless and impossible without the noun. The facts which have led to this notion of transference of conditions are chiefly those of transmitted heat and motion. Here we see effects which may well enough be described as the transference of a condition. The moving body puts another body in motion, and loses its own. The heated body warms another, and cools itself in the same proportion. The magnet brings another body into the magnetic state, and seems to have forced its own condition upon it. These are facts for interpretation. Spontaneous thought says that the agent, in such a case, transfers its condition; but this is only a description, not an explanation. Indeed, it is inexact, even as a description; for what we really see is propagation, not transmission or transference. A condition cannot be transmitted or transferred, because the notion of a state or condition without a subject is impossible in thought. The fact is, that the moving, or heated, or magnetic body, in some totally mysterious way, propagates its state. Of the inner nature of the process we know nothing, and the pretended explanation is only an indifferent description. Even in cases of impact the process is equally mysterious. We see the result, and fancy we understand the method; but there is nothing whatever in spatial contact to explain the results of impact, unless there be a deeper metaphysical relation between the bodies, which generates repulsion between them. Added to these considerations is the further fact that interaction does not

imply that the effect shall be like the cause; and, in the mass of interaction, the effect is totally unlike the cause. A new condition is produced in the thing acted upon, but one quite unlike that of the agent itself.

Empty as this view of the transference of conditions seems, when looked at closely, it has still had a great influence in speculation. The famous phrase "Only like can affect like" is the same view in another form. This pretended principle has found its chief application in discussing the interaction of soul and body, and both idealistic and materialistic conclusions have been based upon it. If one started with the reality of the body, the soul was degraded to material existence. If the soul was made the starting-point, of course it was impossible to reach a real body except by an act of faith. Hence, also, the occasionalism of the Cartesians and Malebranche's theory of the vision of all things in God. Now this maxim, that like affects only like, is mainly based upon the notion that in interaction something leaves the agent and passes into the patient. On this assumption we see the necessity of the maxim; for how could a material state pass into a spiritual being? and how could a spiritual state pass into a material thing? The spiritual state must partake of the nature of spirit, and the material state must partake of the nature of matter. The two, then, must be incongruous. Hence, it was concluded that body and soul could not affect each other. No more could any two things affect each other, so far as they were unlike. The only truth in this doctrine is that things totally and essentially unrelated can never pass into relations of interaction, and, hence, that all true being must constitute a series, without any absolute oppositions. The real difficulty is, not to know how like can affect unlike, but how any two things can affect each other. Why should the state of one thing determine the state of another?

Another verbal explanation of the problem is found in the notion of a passing influence which, by passing, affects the object. But the same objection lies against this view as against the preceding. If, by influence, we mean only an effect, we have merely renamed the problem; but, if we mean anything more, we make the influence a thing; and then we must tell, (1) what the thing is which passes; (2) in what this passing thing differs from the things between which it passes; (3) what the relation of the passing thing is to the thing from which it passes; (4) where the acting thing gets the store of things which it emits; and, (5) how the passing thing could do any more than the original thing from which it proceeds. An attempt to answer these questions will convince one of the purely verbal character of this explanation by passing influences. The great difficulty with many speculators is to conceive how a thing can act across empty space; and hence they think, if something would go across the void, and lie alongside of the thing to be acted upon, all difficulty would vanish. They make action at a distance the real puzzle in interaction. But, to reason, the difficulty is, not to act across empty space, but to act across individuality. If we conceive two things, viewed as independent and self-centred, occupying even the same point of space, we have not advanced a step towards comprehending why they should not remain as indifferent as ever. Contiguity in space helps the imagination, but not the understanding. It is plain that this notion of a passing influence is a mere makeshift of the imagination, which gives no light when taken in earnest.

Akin to this view is that current among physicists, according to which forces play between things and produce effects. But this view also is a device of the imagination, and solves nothing. The fact to be explained, when reduced to its lowest terms, is this: When A changes, B, C,

D, etc., all change, in definite order and degree. To explain this fact, it is said that forces play between *A*, *B*, *C*, etc. But here, as in the case of the influence-theory, the force must be either a mere name for a form of activity, or it must be a thing, and either alternative is inadmissible. If force be a mere name, it explains nothing; and, if it be a thing, it leaves the problem darker than before. All the questions asked about the influence would arise about the force. Thus our difficulties are increased, and no insight is gained. Besides, we have seen that force is only an abstraction from the forms of a thing's activity. Things do not act because they have forces; but they act, and from this activity the mind forms the abstraction of force. To say that things are held together by their attractions is only to describe the fact. The attractions are nothing between the things, like subtle cords, which bind them together. They are merely abstractions from the fact that coexistent material things, in certain conditions, tend towards one another. They do not give the slightest insight into the fact or its possibility.

Again, things are often said to have spheres of force about them; but this, too, is only a description of facts. The sole reality is things, and between and beyond them is nothing; but these things are not mutually indifferent, but are implicated in one another's changes. This relation may be illustrated as follows: If we conceive a perfectly elastic system in equilibrium, any permanent displacement of any part would demand a readjustment of all the other parts, in order to restore equilibrium. Thus, a change in any part would involve a change in all parts. The actual system implies a like community of being. The position and condition of each have a significance for the whole, and for any change in any one part there is a corresponding change in all the rest. But how can independent things

stand in such relations of community and interaction? The scientific doctrine of forces which play between things merely describes the fact itself; taken as an explanation, it is grotesquely untenable. Indeed, the admission that these go-between forces are only abstractions from the fact to be explained reduces the physical theory to the harmony of Leibnitz. Each thing is supposed to be individual, and it gives and receives nothing. Things move in parallel lines, and that is all. But this is essentially Leibnitz's theory. The physical theorists have long been oscillating confusedly between this view and some monistic conception of causation.

The traditional notions of interaction thus appear in their superficiality and untenability. They derive all their force from the conviction that there must be causality somewhere, added to the naïve assumption of sense-thought that the objects of perception are true ontological beings, and that they are the only realities in the neighborhood. Meanwhile the laws of the reciprocal changes of things may be called their interaction, and the inductive study of these laws is confounded with the metaphysical problem.

This brings us to consider the notion of interaction itself, and to point out the contradiction which lies in the necessary interaction of mutually independent things.

Resuming the thought of a previous paragraph, we point out once more the exact adjustment of every member of an interacting system to every other, so far as interacting. In such a system every member must do what it does, because every other member does what it does. The causality of each is relative to the causality of all. The formula for the activity of any one must be given in terms of the activities of all the rest. But this implies that the being of each is relative to the being of all, for the being itself is impli-

cated in the activity. We have before seen that there is no lump or core of being in a thing to which the activities are externally attached, or into which they are thrust. Hence, in addition to saying that things do what they do because other things do what they do, we must say that things are what they are because other things are what they are. Both the being and the activity are implicated in the relation; and it would be impossible to define the being except in terms of the relation. Such being is necessarily relative. It does not contain the ground of its determinations in itself alone, but also in others. And this must be the case with all things which are included in a scheme of necessary interaction.

And thus the contradiction in the notion of the necessary interaction of mutually independent things is placed in a clear light. By definition, the independent must contain the ground of all its determinations in itself, and, by analysis, it is plain that whatever is subject to a necessary interaction must have the grounds of its determinations in others as well as in itself. The two conceptions will not combine. Every attempt to bridge the chasm between independent things by some passage of forces, or influences, results in a purely verbal explanation which leaves the essential contradiction untouched.

If, then, A, B, C, D, etc., are assumed ontological units which are comprised in an order of necessary interaction, we cannot allow that they are either absolutely or mutually independent. They exist only in relation to one another within the system. What, then, is independent? A dependent which depends on nothing is a contradiction; and equally so is an independent made up of a sum of dependents. If A, B, C, and D are severally dependent, then $A + B + C + D$ are likewise dependent. There is nothing in the sign of addition which is able to transform depen-

dence into independence. A first thought would likely be that the system itself is independent, and that the members depend on it; but this is only a logical illusion, so long as *A*, *B*, *C*, *D*, etc., are supposed to be the only true existences. In that case the system would be only a sum, or conceptual product, and would be ontologically nothing. And such it would remain unless we reversed the order, and instead of trying to construct the system from *A*, *B*, *C*, etc., as true units of being, rather regarded the system itself as the true existence, and *A*, *B*, *C*, etc., as its dependent implications. The self-centred, the true ontological fact would be the system, and all else would depend upon it. But system is not a good term for this conception. The idea is that of a basal reality which alone is self-existent, and in which all other things have their being.

The reciprocal changes of phenomena are the fact of experience; or, if we regard these phenomena as things, then the reciprocal changes of things are the fact of experience. The explanation of these changes is a speculative problem, whose solution is not immediately obvious. But one thing is clear. We cannot explain them by anything in the phenomena, or in the things themselves. In order to escape the contradiction involved in the necessary interaction of mutually independent things, and also that involved in reaching an independent being by summing up dependent things, we must transcend the realm of the relative and dependent, and affirm a fundamental reality which is absolute and independent, and in the unity of whose existence the possibility of what we call interaction finds its ultimate explanation. The interaction of the many is possible only through the unity of an all-embracing one, which either co-ordinates and mediates their interaction, or of which they are in some sense phases or modifications.

Two conceptions of the relation of the many to the one

are possible. We may regard the many individuals as ontologically distinct from the one and from one another, and as brought into interaction only through the mediation of the basal one which posits and co-ordinates them according to the plan of the whole. The real ground of their co-ordination is not anything which the many themselves do, but rather that which is done for them and with them by the co-ordinating one. Their interaction, then, is only apparent, and is, in fact, the direct action of the one in adjusting them to the demands of the system. This view reduces to a universal occasionalism, so far as the interaction of the finite is concerned. The one incessantly adjusts and co-ordinates the relations of the many.

The other possible conception of the relation of the one to the many is that the many have no proper existence or thinghood in themselves, and are only modes or phenomena of the one, which alone truly is. In our thought these modes assume the appearance of individual things in interaction, but in reality there is nothing but the one true being and its modes. In the nature of this being these modes are mutually determined, because they are all modes of the one, and because the same being is present in all as their ground and reality.

The latter view is the one to which reflection inclines for the physical world; for thought is rapidly reducing this world to phenomenal existence, and making it the manifestation of an energy not its own. Besides, in this world, what is given is not individual ontological things, but manifold phenomena, and when this fact is grasped it is easy to accept a single ontological ground as their only adequate explanation. But the former view of the relation is the one which must be held in the case of the finite spirit; for here we have a being endowed with the wonderful power of selfhood, whereby it is enabled to become an individual,

in distinction from all others, and to know itself as such. Things whose activities are exhausted in interaction have only being for others, and may well be only phenomenal; but things which, in addition, have inner life, have being for themselves, and cannot be dissolved into phenomena.

A great many questions, whose consideration we postpone for the present, emerge at once in contemplating this result. The one conclusion which now concerns us is that the popular conception of interaction must be transformed. The demand for a causal ground for the mutual changes or reciprocity of things is entirely justified, but the conception which finds that ground in interaction, or the transitive causality of independent things, is untenable. Interaction cannot be conceived as a transitive causality playing between things; it is rather an immanent causality in a fundamental unitary being.

Possibly it may occur to us that the same argument which we have used is equally valid to disprove any interaction of the finite and the infinite. We have all along assumed the possibility of an interaction between the two; and yet the infinite is certainly individual, and the finite is certainly distinct from the infinite. Here, then, we seem to need a new bond to connect these new members, and so on in infinite series. The reply is simple. Our argument has been based on the assumed independence of both members of the interaction, and applies only to that assumption. When two things are mutually independent, interaction can take place only through a mediating third, which embraces both of them. But the independent may freely posit the dependent, and may also posit a continuous interaction between itself and the dependent; but such interaction is throughout a self-determination, and is not forced upon it from without.

This point seems too obscure for any influence; and yet

confusion here is at the bottom of the philosophy of the unconditioned. In particular, Mansel sought to show that God could not be thought of as cause, because as cause he must be related to his effect. He cannot, then, be creator, because as such there must be a relation between God and the world. But this objection overlooks the fact that relation in the abstract does not imply dependence. The criticism would be just if the relation were necessary and had an external origin. But as the relation is properly posited and maintained by himself, there is nothing in it incompatible with his independence and absoluteness.

But this conclusion concerning interaction only makes the problem of causation more obscure and difficult. As long as we had separate and distinct individual things, we could easily picture them in their mutual otherness and externality, and could as easily supplement the perception of their reciprocal changes by the thought of forces resident in the things; and thus the problem seemed to be satisfactorily solved. But now that we are driven out of this notion, we seem to be wandering in unpicturable and impalpable darkness, where all sense of direction and reality is lost. If we think of the many they fuse into the one; if we think of the one it breaks up into the many. We are in the midst and depths of the Heraclitic flux; and all its waves and billows go over us.

This reference to Heraclitus recalls some of the results of the last chapter. We there saw that the thing, A, instead of remaining rigidly A, runs through the series A, A_1, A_2, etc.; and when we asked in what the objective unity of such a thing consists, we found it to consist in the causal continuity whereby the members of the series are bound together. The formal unity of thought is simply the fact that we call the thing one; and such unity may be given to

any plurality whatever. But the real unity lies in the fact of a causal relation; the earlier members produce the later ones, and in producing them become them or vanish into them. This brings us to consider the second general application of the causal idea, the transformation of antecedence into causality.

And here, as elsewhere, the two points so often referred to must be borne in mind. We must distinguish between the phenomenal and the metaphysical question. We must also distinguish between the conviction that causality is really in play, and the form in which we try to conceive it. Without doubt there must be some dynamic bond underlying the successive phases of the thing, but the form in which we must think it is not immediately evident.

Let us take, then, the series, A, A_1, A_2, A_3, etc., which we call a thing, and see what we can make of it. The causality is now within the series, not beyond it. The cause produces, and, in producing, becomes the effect. This conception is often illustrated by reference to the transformations of energy; in which, it is said, one phase of energy produces another phase, and thus passes into it, so that the cause vanishes into the effect, or rather reappears in the effect.

We are certainly standing here, if we do stand, in slippery places. It is only by the help of the formal identities of thought that we can express this doctrine at all. In order to think, we must have a subject and a predicate; but in the case supposed the real subject vanishes as the predicate comes; and the predicate does not arrive until the subject has gone. The subject, then, is the subject of a not-yet-existing predicate; and the predicate is the predicate of a no-longer-existing subject. We overlook this from holding the subject in our thought, treating of it as the thing or the series, and viewing it as the same thing or

series throughout. As soon as we guard ourselves against this illusion, it becomes evident that no metaphysical predication whatever, causal or otherwise, is possible until we bring the entire metaphysical movement within the range of thought and view it as constituted by thought. Logic shows that the temporal and changing can be grasped only through a timeless and unchanging idea. If the changing be viewed as the temporal realization of an idea by a fundamental intelligence, it lies within the range of thought and is constituted by thought. Otherwise all positive predication is absurd. Epistemology also shows that thought can never recognize anything which has not its origin in thought somewhere, and that the conception of a reality existing by itself, apart from thought, independent of thought, and having separate ontological laws of its own, is a fiction of the first magnitude; and we have just seen that, in a world of change, such a fiction results in cancelling predication altogether.

All predication, then, must take place within the sphere of intellect, and with reference to intellect. Any conception of reality, which is at once intelligible and tenable, runs back to intelligence as its necessary implication and presupposition. Every other conception must lose itself either in mere phenomenality or in the vanishing flux of Heraclitus. The existence of things, then, has no meaning except with reference to intelligence; for if we subtract from the world of real things those constitutive elements which thought contributes, and which have no meaning apart from thought, there is nothing intelligible left. And thus we see that the deepest thing in existence is neither being nor causation, as abstract categories, but intellect as the concrete realization and source of both. That is, intellect cannot be construed from the categories of being and causation as something deeper than itself; on the contrary, they are categories of

intellect, and are realized only in and through the activity of the intellect. And to find the ontological meaning of these categories, we must have recourse to our experience of intellect, and not to any analysis of abstract ideas. Not until we raise them to the form of living and working intelligence do we reach any concrete meaning which the dialectic of thought will not dissolve and dissipate.

Again returning to our series, A, A_1, A_2, etc., we find an additional difficulty as follows: The A which is to become A_1, etc., must have some essential relation to the later members of the series, otherwise we lose the notion of ground altogether. When we are dealing with dependent things the easiest solution of the problem is to view the series as the realization in temporal form of an idea which underlies the series. When we are dealing with the fundamental reality the best account of the successive stages is to refer them to the continuous self-determinations of the absolute intelligence, according to an abiding plan. But spontaneous thought chooses another way. It has not learned the dialectic of the metaphysical categories, when conceived on the impersonal plane, and thinks to find the solution of the problem in the notion of potentiality. The later members of the series were potential in the earlier.

But so far as any insight is concerned, this is a purely formal solution. It is simply a declaration that there must be a determining connection somewhere, and a resolve to find it in the earlier stages of the thing. But, as was pointed out in discussing the categories in the *Theory of Thought and Knowledge*, this notion of potentiality is exceedingly elusive on the impersonal and necessary plane, and gains a positive content only as we base it on free intelligence. The impersonal potentiality must be an existing determination of being of some sort, and what it is, or how it passes into actuality, is beyond us. The only thing we can say is

that the unpicturable nature of a thing is such that, under a given condition, x, it passes into a new state, and under another condition, y, it passes into another state; and these two states may be said to be potential in the thing, but only in the sense that they will be developed under the conditions x and y.

At first sight this view seems to help the matter, but it soon appears that we are not much further on. It is, first, plain that it does not escape the difficulties concerning metaphysical predication in a changing world; indeed, these remain untouched, and even unsuspected, because of the formal identity involved in the language. But apart from these we also need to know what and where these conditions x and y are to be found. If they lie outside of the series in some other series, then we have the problem of interaction; and the potentialities of A become complicated with the question of its dependence on the fundamental reality. If they lie within A itself, we are grievously puzzled to know what "within" means, or how within the unity of A there can be these antitheses of A and its conditions. If they are always there, their consequences must always be there; and if they arise in time there must be some further condition of their emergence. Thus we start on the infinite regress, and thought collapses. And it will stay collapsed until we reach a conception of causation which provides for a beginning; that is, until we rise to the conception of self-determining intelligence as the true and only type of proper causality.

Thus it appears the causality which manifests itself in the form of antecedence and sequence eludes us so long as we regard it as an impersonal activity under the temporal form. In that case it is an activity without a subject, for the subject disappears in the flow. Neither is it activity, but activities. Both the "it" and the activity vanish into

indefinite plurality, and thought vanishes along with them. Or, if thought remains, it is because existence is not thus constituted, but has its essential root and bond in active intelligence.

We reach the same conclusion from a consideration of the category of unity. We have frequently referred to unity as if its meaning were self-evident and admitted of no question. In particular we have maintained that there must be a fundamental reality which is ontologically, and in the strictest sense, one in order to explain the fact of system and the reciprocity of things. Unities of classification, or formal unities which arise when thought calls many things one, will not suffice. A true substantive unity is required, and the form in which substantial or metaphysical unity must be thought begins to be a problem.

The notion of real unity has several elements. The first and lowest is negative. It denies composition and divisibility. A compound is not a thing, but an aggregate. The reality is the component factors. Hence the divisible is never a proper thing, but only an aggregate or sum. The thought of a compound is impossible without the assumption of component units; and if these in turn are compounds, we must assume the other units; and so on, until we come to ultimate and uncompounded units. Hence proper unity and proper reality can be found only in the uncompounded and indivisible. All else is formal or phenomenal.

But this result forbids us to find proper unity in anything spatial. An extended body exists only as its parts exist. This is true, whether we regard the body as atomic or as continuous. If the body have an atomic constitution, the truth is self-evident; for then the body is but the aggregate of the parts, and exists in them just as number exists only in its component units. But if the body be viewed as continuous and not compounded, its existence in space allows

us to divide the volume into different parts, each of which exists in its own space, and is distinct from all the other parts. Thus the body, though continuous, appears as the integral of its parts, and exists only as these parts exist. But it cannot exist as the sum of these parts without positing an interaction among the parts. That the part *B* shall maintain itself between and against *A* and *C*, it must be able to prescribe to *A* and *C* their positions relative to itself. The same is true for all other parts; and the conclusion is, that the extended body, though continuous, is yet a complex of interacting forces. This conclusion remains valid even if the body be indivisible; for such indivisibility would not rest upon a true unity of the thing, but only upon the greatness of the cohesion between the parts. The body would still be a system of interacting forces. Hence no body which exists extended in space can be a unit. It will always be possible to distinguish separate points in the volume of the thing; and these can be held together and apart only as these points are made the centres of cohesive and repulsive forces. But in order that a thing shall be a true unit, it must allow no distinction of parts, and no activities which are activities of parts only. But this distinction of parts will always be possible so long as a thing is regarded as having real extension.

And now it begins to be clear that there can be no real unity on the impersonal plane. Logic shows that on this plane we reach neither the one from the many nor the many from the one. Thinking on the plane of necessity, and under the law of the sufficient reason, we can never logically escape our starting-point, whatever it may be. If we assume unity we are unable to take one step towards plurality, for the unitary necessity refuses to differentiate or to move at all. Conversely, if we start with plurality we never escape it, for logic compels us to carry the many into

their antecedents. If we trace the plurality to some being which we call one, we are forced to carry the plurality implicitly into the unity by assuming some complexity of nature, and some complex antithesis and mechanism of metaphysical states in the one being. But in that case, though we confidently talk about unity, we are quite unable to tell in what the unity of such a being consists. The truth is, it has no unity but the formal unity we give it in calling it one.

This puzzle can be solved only as we leave the mechanical realm for that of free intellect. The free and conscious self is the only real unity of which we have any knowledge, and reflection shows that it is the only thing which can be a true unity. All other unities are formal, and have only a mental existence. But formal and real unities alike exist only for and through intelligence.

And here we come again upon a fact which we have before dwelt upon—namely, that active intelligence cannot be understood through the metaphysical categories, but these categories must be understood as realized in active intelligence. We have seen this illustrated in the case of being and causation, and now it finds further illustration in the case of unity. We can make nothing of the abstract category of unity. Thought is not possible through a preexisting unity, but unity is realized through thought in action. Just as little can we abstractly combine unity with the complexity and variety which are needed to save thought from the deadlock of a monotonous simplicity. This problem is solved for us in our experience of free intelligence. Here we find a unity which produces plurality without destroying itself. Here the one is manifold without being many. Here the identical posits an order of change and abides unchanged across it. But this perennial wonder is possible only on the plane of free and self-conscious intelligence.

Interaction between the many must be replaced by immanent action in the one. Impersonal causality vanishes hopelessly in the Heraclitic flux. The impersonal itself falls asunder into a plurality either in space or time, and we seek in vain for any substantial bond. Living, active intelligence is the condition both of conceptual and of metaphysical unity. Volitional causality, that is, intelligence itself in act, is the only conception of metaphysical causality in which we can rest. Science may study the laws of sequence and reciprocal change under the name of causation, and there is no objection, so long as we understand that this is not causation at all. But when we come to proper efficiency, it is either volitional causality or nothing. And if we are to escape the abyss of the infinite regress, and are not to make shipwreck of reason on the problem of error, this volitional causality must be viewed as self-determining or free.

Thus we get an insight into the profound speculative significance of free intelligence. Logic shows that without freedom we can never solve the problem of error or satisfy any of our rational demands. Explanation is possible only through free intelligence. Unity, identity, and causality are possible only through free intelligence. Truth itself is possible only through free intelligence. The difficulty which popular thought finds in this conception arises, first, from its misinterpreted sense-experience, which is commonly taken to be law-giving for metaphysical thought; and, secondly, from a superficial conception of its own categories. Criticism removes much of the paradox from our result by pointing out the distinction between the phenomenal and the metaphysical points of view, and completes the work by showing that the metaphysical categories contradict themselves until they are realized in active intelligence.

What we call the interaction of the many is possible only

through the immanent action of the one fundamental reality. This being, as fundamental and independent, we call the infinite, the absolute, the world-ground. In calling it the infinite, we do not mean that it excludes the co-existence of the finite, but only that it is the self-sufficient source of the finite. In calling it the absolute, we do not exclude it from all relation, but deny only external restriction and determination. In calling it the world-ground, we do not think of a spatial support, and still less of a raw material out of which things are made, but rather of that basal causality by which the world is produced and maintained. Everything else has its cause and reason in this being. Whatever is true, or rational, or real in the world must be traced to this being as its source and determining origin. But this point we reserve for the next chapter.

CHAPTER V

THE WORLD-GROUND

In the last chapter we reached the conclusion that all things depend in some way upon one basal being which alone is self-existent. But this conclusion raises many questions and not a few difficulties. In particular, the relation of the world to its metaphysical ground, or the relation of the finite to the infinite, demands further specification. Conversely, we need to determine more closely the relation of the world-ground to the finite, or to fix its significance for the system by virtue of its position as basal and infinite. But, instead of immediately applying the results already reached, we shall find our advantage in returning to some extent to the stand-point of popular thought. Thus we shall trace the dialectic of crude thinking, and better understand its confusions. Meanwhile we can apply the results of criticism as a corrective upon occasion. Logically, there is a shorter way; but pedagogically the plan proposed seems more promising.

The discussions of the first chapter have freed us from the superstition of passive substance or pure being. We there found that the notion of substance is entirely exhausted in the notion of cause, and that agents only can lay any claim to existence. The infinite, then, is not to be viewed as a passive substance, but as a unitary and indivisible agent. Indeed, the misleading connotations of the notion of substance are such that we shall do better to drop

it altogether, and replace it by cause, or agent. We are compelled to do this by critical reflection; and the advantages are great. The notion of substance carries with it many implications of the imagination; and these are perennial sources of error. It is largely conceived as a plastic something, or as a kind of stuff which can be fashioned into many things. These implications, rude and crude as they are, have modified disastrously most pantheistic speculation. The infinite has been viewed almost as a kind of raw material out of which the finite is made, and hence as at least partly exhausted in the finite. Sometimes the representation is less coarse; and the infinite appears as a kind of background of the finite, something as space appears as the infinite background and possibility of all finite figures in it. The infinite is further said to produce, or emit, the finite from itself; or, by a process of self-diremption, to pass from its own unity into the plurality of finite things. It is the pure being which appears in all things as the reality of their existence.

The finite, on the other hand, is spoken of as parts or modifications of the infinite, or as emanations from the infinite, or as partaking of the infinite substance. Many pantheistic speculators have spoken of God as making the world out of himself. Others, again, have found the world in God prior to creation; and creation they view as the escape of these hidden potentialities into realization. Both alike have applied the notion of quantity to the problem, and have greatly exercised themselves with the inquiry whether God before creation be not equal to God plus the world after creation. This entire class of views rests mainly upon a false and uncritical notion of substance which identifies it with pure being or stuff; and they appear at once in their crudity and untenability when the stuff-idea is exploded. There is no stuff in being. The infinite substance means

the infinite agent, one and indivisible. To explain the universe, we need not a substance but an agent, not substantiality but causality. The latter notion expresses the meaning of the former, and is, besides, free from sense-implications.

This necessity of viewing all true existence as causal and unitary cancels at once a host of doctrines which have swarmed in pantheistic speculation. When we speak of the infinite as substance, the misleading analogies of sense-experience at once present it as admitting of division, aggregation, etc.; but when we think of it as an agent, these fancies disappear of themselves. As an agent, it is a unit, and not a sum or an aggregate. It is, then, without parts; and the notions of divisibility and aggregation do not apply. Hence we cannot view the finite as a part of the infinite, or as an emanation from the infinite, or as partaking of the infinite substance; for all these expressions imply the divisibility of the infinite, and also its stuffy nature. No more can the finite be viewed as produced by any self-diremption of the infinite; for this, too, would be incompatible with its necessary unity. All of these views really deny the infinite and replace it by an aggregate. The one divides itself into the many, and thereafter is only the sum of the many. But thereby the one disappears and the many alone exist. The difficulty is double. First, the notion of division has no application to true being, but only to aggregates; and, second, if it had application, the result of dividing the infinite would be to cancel it, and replace it by the sum of the finite. But this would be to return to the impossible pluralism of uncritical speculation. The attempt to divide and retain the unity at the same time is as if one should speak of the mathematical unit as producing number by self-diremption, and as remaining a unit after division. The necessary unity of the infinite forbids all attempts to identify it with the finite, either totally or partially. If

the finite be anything substantial, it must be viewed as ontologically distinct from the infinite, not as produced from it, but as created by it. Only creation can reconcile the reality of the finite in this sense with the unity of the infinite. For the finite, if thus real, is an agent; and as such cannot be made out of anything, but is posited by the infinite. How this can be we do not pretend to know; but any other view is wrecked by its own contradictions.

Similar objections lie against all views which speak of the finite as a mode of the infinite. We have ourselves used this expression, and it is all the more necessary to define its meaning. In its ordinary use it is based on the notion of passive substance, or pure being. Being is said to be one in essence, but various in mode; as the same raw material may be built into many forms. Accordingly all finite things are called modes, or modifications of the infinite. But it is hard to interpret this language so as to escape the absurdity of pure being and remain in harmony with the necessary unity of the infinite. The notion generally joined with such language is that each thing is a particular and separate part of the infinite; just as each wave of the sea is not a phase or mode of the entire sea, but only of that part comprised in the wave itself. But the unity of being is compatible with a plurality of attributes only as each attribute is an attribute of the entire thing. Any conception of diverse states which are states of only a part of the being would destroy its unity. The entire being must be present in each state; and this cannot be so long as the notion of quantity is applied to the problem. Hence, in speaking of finite things as modes of the infinite, we must not figure the relation as that of the sea to its waves, or as that of material to the form impressed upon it. If, then, finite things are modes of the infinite, each thing must be a mode of the entire infinite; and the infinite must be

present in its unity and completeness in every finite thing, just as the entire soul is present in all its acts. Any other view of the modes would cancel the unity of the infinite and leave the modes as things in interaction. The infinite, then, cannot be viewed as a sum of modes, nor as partly in one mode and partly in another; but it must be present alike in each and every mode. Neither can the modes be viewed as forms or moulds into which the infinite substance is poured. Even this gross conception has not been without influence in the history of speculation; but it needs no criticism. In general, the phrase, modes of being, is misleading. It is allied with the imagination; and the mind always seeks to picture it. Just as we tend to conceive substance as a kind of raw material out of which things are made, so we tend to think of a mode as a mould into which the raw material is cast. Of course, the attempt to picture instead of to think results in absurdity. The view that being is cause cancels these misconceptions. Indeed, no other view can meet the demands made on the modes. The only way in which a being can be conceived as entire in every mode is by dropping all quantitative conceptions and viewing the being as an agent, and the modes as forms of its activity. Hence the doctrine that things are modes of the infinite can only mean that things are but constant forms of activity on the part of the infinite, and that their thinghood is purely phenomenal. Of course, it is impossible to tell how the one can act in various ways so as to produce the appearance of a world of different and interacting things; but this is only the impossibility of telling how there can be unity in variety, and, conversely, how there can be variety in unity.

We reach, then, the following conclusion: The infinite is not a passive substance, but the basal cause of the universe. As such, it is one and indivisible, and is forever

equal to itself. Of the finite, two conceptions are logically possible. We may view it merely as a form of energizing on the part of the infinite, so that it has a purely phenomenal existence; or we may view it as a substantial creation by the infinite. But in no case is it possible to identify the infinite with the finite, either totally or partially.

The decision between these two views of the finite, as already pointed out, can be reached only by studying the facts of experience. If any finite thing can be found which is capable of acting from itself and for itself, it has in that fact the only possible test of reality, as distinguished from phenomenality. But this possibility can be found only in the finite spirit. It avails nothing against this conclusion to say that the world-ground may posit impersonal agents as well as personal ones; for the notion of the impersonal finite vanishes, upon analysis, into phenomenality. In seeking for identity, we found it only in the personal. In seeking for causality, we found it only in the personal. In studying interaction, we found that the causality of the finite cannot properly extend beyond its own subjectivity, and the impersonal has no subjectivity. On all these accounts we must hold the impersonal is possible only as dependent phenomenon, or process of an energy not its own. Only selfhood serves to mark off the finite as substantial reality, and to give it any ontological otherness to the infinite. Apart from this, there is essentially nothing but the infinite and its manifold activities. The impersonal finite attains only to such otherness as a thought or act has to its subject.

But the personal finite, the spirit, must be viewed as created. It is not made out of pre-existent stuff, for the stuff notion has disappeared. It is not made out of any-

thing, not even out of nothing; it is caused to be. Creation has a positive and a negative meaning. Positively, it means to posit in existence something which before was not; negatively, it denies that this something is made out of pre-existent material, or that the creator is less after the creative act than before. This is all that creation means; and to this we are shut up by the contradiction of any other view. Of course, no one can hope to tell how creation is possible, but we can clearly see that the alternative views are impossible.

Without some mental steadiness at this point it is easy to fall into some species of pantheism. In spite of the demonstrable inapplicability of the category of quantity to the relation of the finite to the infinite, a swarm of metaphors and imaginings based on this category are sure to spring up in uncritical minds, and impose on them their fictitious solutions. As the one space or time includes all finite spaces or times, so we may easily fancy that the infinite includes the finite as its constituent parts. Logical relations also lend themselves to the illusion. For, as all particulars are logically but accidents or specifications of the universal, which embraces them all, we may readily suppose that all particular beings are but specifications of the universal being. Critical vigilance is the price of liberty in the case of these illusions. We must see that quantity is a self-destructive category when applied beyond phenomena. We must also distinguish between logical subordination and ontological implication. The universal, which applies to all the particulars, implies none of them.

A more subtle source of error concerning this matter lies in the necessary dependence of the finite. The finite is dependent on the infinite, and is also a member of a system to which it is continually subject. The result is that the finite spirit has only a limited and relative existence at best. As

compared with the infinite, it has only a partial and incomplete existence. In the fullest sense of the word, only the infinite exists; all else is relatively phenomenal and non-existent.

By thinking along this line in an abstract way it is easy to come to this conclusion; and every reader acquainted with the history of speculation will recall how often men have stumbled into pantheism at this point. Nor is it easy to escape this conclusion so long as we dwell on the abstract categories of finite and infinite, dependent and independent, phenomenal and real, existence and non-existence. The truth is we have no insight into these categories which will enable us to decide what is concretely possible in this case. We have to fall back on experience, and interpret the categories by experience, instead of determining experience by the categories. Any other method is illusory and the prolific source of illusions.

Adopting this method, we discover that, while we cannot tell how the finite can be, it nevertheless *is*. The finite may not exist in the full sense of the infinite, but for all that, in a small way, it is able to act and is acted upon. In the sense of self-sufficiency there is but one substance, as Spinoza said; but it does not follow that all other things are only powerless shadows, for there are a great many substances which can act and be acted upon. It matters little what we call these, provided we bear this fact in mind. They are not substances, if substance means self-sufficiency. They are substances, if substance means the subject of action and passion. If, then, we bear our meaning carefully in mind, we may say that only the infinite exists or truly is, that the finite has only partial, relative, incomplete, non-existent existence; and there would be a sort of truth in the saying. But these utterances are so easily misunderstood that they should be reserved for esoteric use, and

frugality is to be recommended even there. In these operations we must proceed antiseptically, and sterilize our verbal instruments by careful definition before we begin.

Now when we consider life at all reflectively we come upon two facts. First, we have thoughts and feelings and volitions; and these are our own. We also have a measure of self-control or the power of self-direction. Here, then, in experience we find a certain selfhood and a relative independence. This fact constitutes us real persons, or rather it is the meaning of our personality. The second fact is that we cannot regard this life as self-sufficient and independent. How the life is possible we do not know; we only know that it is. How the two facts are put together is altogether beyond us. We only know that we cannot interpret life without admitting both, and that to deny either lands us in contradiction and nonsense. It is no doubt fine, and in some sense it is correct, to say that God is in all things; but when it comes to saying that God is all things and that all forms of thought and feeling and conduct are his, then reason simply commits suicide. God thinks and feels in what we call our thinking and feeling; and hence he blunders in our blundering and is stupid in our stupidity. He contradicts himself also with the utmost freedom; for a deal of his thinking does not hang together from one person to another, or from one day to another in the same person. Error, folly, and sin are all made divine; and reason and conscience as having authority vanish. The only thing that is not divine in this scheme is God; and he vanishes into a congeries of contradictions and basenesses.

For note the purely logical difficulties in the notion, not to press the problem of evil and error just referred to. Suppose the difficulty overcome which is involved in the inalienability of personal experience, so that our thoughts and life might be ascribed to God. What is God's relation

as thinking our thoughts to God as thinking the absolute thought? Does he become limited, confused, and blind in finite experience, and does he at the same time have absolute insight in his infinite life? Does he lose himself in the finite so as not to know what and who he is; or does he perhaps exhaust himself in the finite, so that the finite is all there is? But if all the while he has perfect knowledge of himself as one and infinite, how does this illusion of the finite arise at all in that perfect unity and perfect light? There is no answer to these questions, so long as the infinite is supposed to play both sides of the game. We have a series of unaccountable illusions and an infinite playing hide-and-seek with itself in a most grotesque metaphysical fuddlement. The notion of creation may be difficult, but it saves us from such dreary stuff as this. How the infinite can posit the finite, and thus make the possibility of a moral order, is certainly beyond us; but the alternative is a lapse into hopeless irrationality. We can make nothing of either God or the world on such a pantheistic basis. Accordingly, we find writers who incline to this way of thinking in uncertain vacillation between some "Eternal Consciousness" and our human consciousnesses and without any definite and consistent thought concerning their mutual relation, but only vague and showy phrases.

The illusion is completed by taking thought abstractly and forgetting the personal and volitional form of concrete thinking. The infinite thought as conception of course embraces all things, but it must embrace them as what they are. On the side of the infinite we have not a resting thought, but a thinker and a doer. And on the side of the finite spirit also we have no mere conceptions of the divine understanding, but thinkers and doers also; and in that fact they have an inalienable individuality and personality. When we sweep all these together into one concep-

tion, "Thought" or "Consciousness," we only fall a prey to the fallacy of the universal.

Such is the relation of the finite to the infinite. We next consider the relation of the infinite to the finite.

By virtue of its position as world-ground, the infinite must be viewed as the primal source of all finite existence. Since the finite has no ground of being in itself, its nature and relations must be originally determined by the infinite; and hence the finite can be properly understood or comprehended only from the side of the infinite. The finite may be viewed as the outcome or expression of a plan or purpose on the part of the infinite; and it may be viewed as a consequence of the infinite. In the former case, the basal purpose will contain the ground or reason for all the determinations of the system; and a knowledge of the system will depend upon a knowledge of the purpose for whose expression and realization the system exists. No member of the system will have any ontological or other rights, except such as its position and significance in the system secure for it. Freedom apart, every finite thing is what it is, and where it is, and when it is, solely and only because of the requirements of the fundamental plan.

And even if we should conceive the infinite as unintelligent, we must still view the finite as an expression of the nature of the infinite. Atheism and theism alike must regard the finite as dependent on the world-ground. Theism finds the order of dependence expressed in a plan, atheism would found it in the nature of the infinite. This nature then becomes the determining principle of all finite existence. The system and its members will be in every respect what this nature may demand; and a knowledge of what can be or cannot be will depend upon a knowledge of this nature. The meaning or significance of the infinite at any

particular moment will be the sole conditioning ground of all things and events in the system. If movement takes place, it will be because the nature of the infinite calls for it. If it take place in one direction rather than another, it will be because the nature of the infinite would not be satisfied by motion in any other direction. Of course, it is impossible to get any exhaustive formula for this conditioning nature; but the conclusion follows not from any insight into the nature, but solely from the formal position of the infinite in the system.

All speculators alike, then, must pass behind the finite and find the conditioning principle of the finite in the infinite. If, for example, we allow the physical elements to be as real as the physicist assumes, we have still to allow that their number and nature and the order of their appearance are not determined by any ontological necessity in the elements themselves, but only by the demands which the infinite makes upon them. If the system exist for the realization of a plan, the elements will be in all respects what the plan of the system demands. If there be no plan, and the infinite be only a blind energizing, still this energizing will be such as the nature of the infinite demands for its realization. From this point, also, the elements will be produced in just such number, order, and kind as the significance of the infinite demands. Apart from a knowledge of this nature, we cannot know anything about the system. We cannot say that the present order has always existed; no more can we deny it. We cannot say that the members of the system were all produced at once, nor that they were successively originated. No more can we know anything about the future. Whether the members of the system will always continue, or whether they will instantaneously or successively disappear, are questions which lie beyond all knowledge. We do not know what direction the future will

take in any respect whatever. The facts in all of these cases depend upon the plan or nature of the infinite; and unless we can get an insight into this plan and nature, our knowledge of both past and future must be purely hypothetical. No natural law, in and of itself, can give any hint of the time and circumstances of its origin. If the arch of being were sprung at a word, the laws of the system would still have a virtual focus in the past, just as the rays of light from a convex mirror seem to meet behind the mirror, but do not. Or if any new order should arise at any point of cosmic history, this new order would also have a virtual focus in an imaginary history. Of course, "demonstrations" abound concerning what has been and what will be; but the fact which they really demonstrate is quite other than the demonstrators think. If we assume the uniformity of nature, we may indeed reach a certain insight; but the result is purely hypothetical. This uniformity is contingent; and, so far as we know, a complete reversal of all observed methods may occur at any moment. The reason is, that the determining principle of the course of nature lies beyond all observation in the hidden plan or nature of the infinite. Every system which denies the independence of the finite must allow these conclusions. The system will be at all times and in all respects what this plan or nature demands. The finite will come and go, change and become, in accordance with the same rule. The result is that an *apriori* knowledge of the system must be declared impossible; for such a knowledge demands an insight which no finite being possesses. In addition, even deductions from experience are only hypothetically valid.

Quite a swarm of objections spring up at once. To begin with, the crude speculator of popular science takes umbrage at the suggestion that the physical elements are not necessarily fixed quantities. Having heard frequently of the in-

destructibility of matter, the two ideas have stuck together in what he is pleased to call his mind; and now he professes himself unable to separate them. But this mental impotence need not delay us. The indestructibility of matter, in the only sense in which it is proved, is compatible with the complete phenomenality of matter. And how long it shall remain true, even in this sense, depends entirely upon the infinite.

In the next place, the crude philosophical dogmatist will claim that the necessity which rules in nature excludes a view which leaves things at such loose ends. Omitting to inquire whether this necessity be anything more than a shadow of unclear thinking, we point out that in any case the necessity in nature can only mean that existing laws, facts, and events are expressions of necessity, but there is nothing in this fact to assure us that necessity always will express itself in just these forms. That the necessity is compatible with change we know from experience; and what future changes may yet become necessary no one can tell. So far as founding the order and fixity of nature is concerned, chance itself could not leave us more in the dark than necessity; unless we dogmatically declare the present order to be changelessly necessary, and let our will stand for a reason. Critical thought can find no rational security for uniformity and continuity in anything but rational purpose; and as long as we are unable to read the purpose and its implications, we must be content to confine our science to a reasonable degree of extension to adjacent cases; that is, to cases bearing on practice.

A weightier objection comes from the side of the intellectualist, who urges that our view is a relapse into vulgar empiricism. If this objection were well founded, it would be a serious one; and as it is, it makes it necessary more clearly to define our meaning. In the first place, intellect-

ualism, if universally valid, is purely formal. Suppose we allow that all phenomena must appear in space and be subject to the laws of space; there is nothing in this fact to determine which of many possible phenomena shall appear in space. The most diverse phenomena are compatible with the laws of space; and hence these laws do not determine what phenomena shall be realized. This must be determined by something beyond space; and to know the outcome, we must know more than the formal laws of space. Again, allow that the law of causation is universal, there is nothing in this formal law to decide what shall be caused. Here, again, we must go outside of the law to find the reason for any specific event. The same is true for all other intellectual first principles. They are purely formal and determine no specific content. The system of logical categories merely outlines a knowledge of possibility and does not give any insight into the specific nature of reality. A multitude of real systems would be compatible with these categories; and hence these categories do not explain why one of these possible systems should be real rather than another. Within each of these possible systems, also, there is a deal of contingent matter, and this can be learned only from experience. If, then, we were justified in viewing first principles as universally valid, we should still have only a formal knowledge, and not a knowledge of reality. We should have to consult experience to learn what the reality is which exists within these formal limits.

Again, those first principles themselves must be founded in the nature of the infinite. Just as what is real is founded in the infinite, so also what is true is founded in it. In our finite experience we find ourselves working under a system of laws and principles which condition us, and which all our acts must obey. And these laws are not of our making, but rule us even against our will. Under this experience

there grows up the notion of a realm of impalpable and invisible laws, to which all reality is subject. We think of them as ruling over being, and not as founded in being. And thus first principles particularly are conceived as a kind of bottomless necessity, which depend on nothing for their validity, and which would exist if all reality were away. But the untenability of this view is palpable. Laws of every sort, thought-laws among the rest, are never anything but expressions of the nature of being. Reality, by being what it is and not something else, founds all activity and all law. If a realm of law, apart from being, were anything but a mere abstraction, it could not rule being except as it came into interaction with being. To rule rightly, the law must be affected by the changing states of being, otherwise it might command one thing as well as another. Nor would the command itself be enough; it must enforce the command by its action upon its subjects. But this would make the law a thing. It would act and be acted upon, and this is precisely the definition of a thing.

It is, then, a mere delusion when we fancy that there can be anything deeper than being, or anything outside of being. If outside of being, being must remain indifferent to it, unless this outsider be able to act upon and influence being. But this brings it at once under the definition of being. Hence, all laws, principles, phenomena, and all finite reality must be viewed as consequences or manifestations of the basal reality. First truths also, even as formal truths, can be viewed only as expressions or consequences of this reality, and never as its antecedent, or as independent. It may be possible for us to perceive truths which shall be universally valid in the system, true alike for the finite and the infinite; but it is quite absurd to ask what would be true apart from the system. When we ask such a question,

we are always present with our thought-laws, derived from the real system; and our imaginary system is always constructed on the basis of the present system, and this we mistake for an insight into the nature of systems quite distinct from ours. But the answer to such questions always consists in telling what is now true for us as determined by the actual system of reality. The infinite is, and being what it is, the system of law and truth is what it is; and the thought of other and unrelated systems is a pure abstraction from our imaginary constructions.

Some speculators have affected to find a limitation of the infinite in the claim that it is subject to law of any kind; but this is only an overstraining of the notion of independence or absoluteness which defeats itself. It is necessary to the thought of any agent that it have some definite way of working. Without this the thought vanishes and the agent is nothing. This mode, or law, of action, however, is not imposed from without; but is simply an expression of what the being is. As such it is no limitation. The mind is not limited by the laws of thought; but realizes itself in and through those laws. Apart from them it is nothing; and they apart from it are also nothing. The laws are simply expressions of the essential nature of mind. In the same way the laws of the infinite, instead of limiting, but express what the infinite is. They are not antecedent to it, nor separate from it, nor distinct in it. The only reality is the being in a definite mode of activity; and from this fact we form the notion of law, nature, etc. But the fact is always the being in action.

The conclusion, then, is that there is one basal being in action as the source of the system and of all its laws, principles, and realities. And this monism extends not only to things, but to principles also. It has been very common in English speculation to assume any number of principles,

alike independent of one another and of reality. Space and time, especially, have been posited in mutual independence, and also as independent of all reality, finite and infinite alike. A common way of putting it is that space and time would continue to exist if God and the world were both away. But this view violates the necessary unity of fundamental being. Whatever space and time may be, they cannot be independent and original existences; but both alike must be viewed as consequences in some way of fundamental being. This results necessarily from the unity of the basal reality, and from the fact that the nature of this reality must be the determining principle of all secondary existence and of all law and manifestation.

That the world-ground must be conceived as free and active intelligence is the result to which thought continually comes, whatever the line of investigation. If we seek a tenable theory of knowledge we find it only as we reach a basal intelligence. If we seek to bind the many together in an all-embracing system, it is possible only in and through intelligence. If we seek for unity in being itself we find it only in intelligence. If we seek for causality and identity in being we find them only in intelligence. If we would give any account of the intelligible order and purpose-like products of the world, again intelligence is the only key. If, finally, we ask for the formal conditions of reality we find them in intelligence. The attempt to define reality itself fails until intelligence is introduced as its constitutive condition. The mind can save its own categories from disappearing, can realize its own aims and tendencies, can truly comprehend or even mean anything, only as it relates everything to free intelligence as the source and administrator of the system.

Against this theistic view there is properly no competing

view whatever. There seem to be such views, indeed, but they are really only forms of words, sonorous and swelling often, but without any rational substance. To see this, we need only consider the atheistic attempt to refer the world, its order and products, to mechanical necessity. We pass over the deeper logical difficulties involved in this notion of impersonal reality and mechanical causation. We also pass over the epistemological difficulties involved in the problem of error on such a scheme. We say nothing of the puzzle concerning the relation of the human personality to its mechanical ground. We simply point out the emptiness of the doctrine itself when considered as an account of things.

Logic shows how extremely dark and elusive the notion of metaphysical necessity is; here we point out, in addition, its complete barrenness. For necessity, as formal category, contains nothing specific. Nothing can be deduced from it. It gets a concrete content, therefore, only as we apply it to a given matter. We know that the world is necessary, not by deducing it from the abstract category of necessity, but rather by applying the category to the world. Thus the necessity itself is hypothetical, and its contents are learned from experience. That is, it is not necessity in general which explains the world, but the necessity of the world itself which explains it. We know by hypothesis that the world is necessary; and we know that necessity fully explains the world, because that necessity is just the necessity of the world. We simply call things necessary; and, so far as any insight is concerned, we end where we began.

Logic shows that any explanation which does not root in purpose is equally empty. The antecedents which imply a consequent cannot be adequately expressed without taking into account the consequent which they imply. The causes must be defined in terms of their effects, and the

effects must be made potential in their causes. In that case explanation consists simply in affirming or assuming a set of causes such and in such relations that they must produce the effect in question, to the exclusion of every other. Certainly with such causes we could explain the effect; but it must be plain that we have merely postponed the problem. Here also, so far as any insight is concerned, we end where we began.

Some problems admit of competing solutions. Some solutions may be better than others; but all may have some positive value. Non-theistic solutions of world problems, however, are not of this sort. They have no value. Critically examined, they vanish into absolute nothingness, as bubbles when they are touched. Nevertheless, they have been thought to be very weighty. They have caused many a theologian great heart-searching, and have passed for the sum of wisdom itself with herds of popular speculators. This makes it interesting and profitable to trace the source of the illusion.

And we have not far to go to find it. The crude metaphysics of sense-thinking leads to the fancy that we see causes in immediate perception, and see them to be material. Thus the substance and causality of the world are provided. In the next place we discover an order of law, and this is viewed as necessary as a matter of course. Thus the order of the world is explained as due to the reign of law; and as this is necessary, no questions may be asked about it. The necessary is self-sufficient. A remark or two about the indestructibility of matter and the conservation of energy make it plain that this system not only needs no supervision by intelligence, but that it will not even tolerate it. Thus the system of law and nature and the realm of mind are set in mutually exclusive antithesis, so that the more we have of the former the less we must have of the latter. By this

time theistic faith is in a most forlorn condition, and the finishing stroke is given by the fallacy of the universal. By calling everything necessary we make it clear that no questions ought to be raised; and by the aid of the fallacy mentioned we show that there are really no questions to raise. Existence as given is, indeed, quite complex, but we reduce it to simplicity with the utmost ease. Matter and force serve our purpose handsomely, matter representing the existential aspect of reality, and force representing its causal side. Moreover, both of these are scientific terms; and thus we secure the prestige of science for our view, which is no small gain. But in these terms, matter and force, we see nothing but pure simplicity, and hence nothing that needs to be accounted for; nothing, indeed—due account being taken of the indestructibility of both matter and force—that may not well be eternal. Our data, then, raise no question and excite no surprise; and that they are perfectly adequate to the administration of the world is plain, for by virtue of the great principle of evolution the like becomes unlike, the simple becomes complex, the low lifts itself to the high, and, in fine, the indefinite, incoherent homogeneity changes to a definite, coherent heterogeneity, through continuous differentiations and integrations. This is the great fallacy-mill which has ground out most of our showy cosmological speculation.

The fictitious nature of this performance is familiar to us. The necessity which explains all is the necessity which contains all. We reach the necessity from the all, not the all from the necessity; and the necessity itself is hypothetical. The simplifications also are purely verbal, and result from mistaking the abstractions of logic for realities of existence. When we think concretely we can never pass from the complex to the simple or from the simple to the complex until we rise to the plane of free and active intelligence. On the

impersonal and mechanical plane we must always in principle end where we begin

We conclude that all non-theistic schemes have their root in unclear thought, or in the verbal illusions thence resulting. What they call for is not positive disproof, but rather to clarify thought itself and bring it to a consciousness of its own aims and implications. When this is done they vanish of themselves, and leave not even a rack behind.

The results reached in the previous discussion may be held with all conviction. The attempt to understand or even to define the world of things leads to the insight that it is nothing except with reference to intelligence, and that it must be viewed as existing only through a supreme intelligence which is its constitutive condition. In like manner the finite spirit can make nothing of itself until it reaches the thought of a supreme creative spirit in which all finite existence roots. But can we understand, or in any way represent to ourselves, the existence of that supreme being? And if not, if thought loses itself in mystery, if the light we seem to have, upon examination, turns to darkness, theism shades away into agnosticism, and we have our work for nothing. That this is the last result of criticism is a frequent contention. This raises the question concerning the divine personality and the inner thought-life of God.

This discussion has been greatly darkened by confusion of ideas, by applying to God the limitations of the finite, and by mistaken expectations and demands. In popular thought there has been a more or less explicit confusion of personality with corporeality, or at least with form of some kind, combined with spatial limitation and separation. This is helped by the spatial metaphors in which religious speech abounds, and by the fact that in all sense-thinking spatial

separation is the great principle of individuation. A very superficial criticism serves to show the untenability of such a view; and the conclusion is drawn that God is not a person or individual of any kind.

But this conclusion is valid only for personality conceived as implying corporeity, form, and spatial separation. It has no bearing whatever upon personality as self-consciousness, self-knowledge, and self-control; and this is the essential meaning of personality. In affirming that God is personal, critical thought would mean only to affirm that he knows and determines himself and his activities. This fact, however mysterious in its possibility, is perfectly clear in its meaning, and the necessity of its affirmation is obvious.

That God is not a person or individual has been further maintained, on the ground that then he would be one of a kind, would be comprised in a class, and so would lose his infinitude and absoluteness. If we rule out the notion of form and spatial separation, which is implicit in this objection, there is nothing left but logical confusion. If infinite meant only, and absolute meant unrelated, the conclusion might be drawn; but the real infinite is not the all, and the real absolute is not unrelated. And though there be but one infinite and absolute being, yet is it one of a kind and stands in relations posited by itself. As existing, it is of the being kind. As active, it is of the causal kind. As knowing, it is of the knowing kind. To the objection that the first cause cannot be classed, and hence cannot be known, since there can be only one first cause, the answer has been very properly returned that the first wheelbarrow is in the same predicament, and is unknowable for the same reason. Such argument is throughout a play on the etymology of the words, in complete ignorance of their philosophical meaning. Mr. Mill said it was hard to believe it seriously meant.

It is further maintained that we cannot view the infinite as personal, because personality implies consciousness, and consciousness implies the antithesis of subject and object. Hence the infinite as one and only has no object, and hence, again, cannot be viewed as conscious. Consciousness then is necessarily a contradiction when ascribed to the infinite.

Here we have confusion again. The antithesis in question is purely a logical or psychological form, and does not involve an ontological otherness. Psychologically, the subject is subject only as there is an object; and the object is object only as there is a subject. But this denotes only the antithetical form of consciousness in general, and is as valid for self-consciousness as for any other. But subject may also denote a particular knowing subject, and object may mean some independently existing object; and in unclear thought it is easy to confuse these meanings and infer a variety of things. We may conclude to the impossibility of self-consciousness, or to the denial of the infinite personality. Or, by short and easy steps, we may conclude that God and the world mutually imply each other. For is not God subject, and is not a subject a contradiction without an object? Likewise is not the world very much of an object, and must it not have a fitting subject? Thus by duly considering and appropriately manipulating the fundamental antithesis of subject and object we may get a rich variety of important speculative truths. But that the infinite should know itself and thus make itself its own object, or by its activity should give itself objects, is a conception to which this profound psychology is quite irrelevant.

Further difficulties arise from transferring to the infinite the limitations of the finite. Our intellect is limited in range and in methods. Where direct insight fails we have to resort to roundabout methods, induction, proof, etc. Our intellect is developed also; and some speculators have been

pleased to define intelligence in such a way as to make development a part of the definition. Our consciousness also begins and is conditioned by a great variety of circumstances beyond our control. It is easy to see that these conditions cannot be applied to the infinite being; and then it is easy to say that conscious intelligence cannot be attributed to the infinite.

But the essential meaning of intelligence is the power to know. It is no part of the notion that it must begin, or that it should be developed, as a progressive "adjustment of inner relations to outer relations," or that it should use certain methods. The only thing essential to intelligence is that it should be able to know. Likewise, it is no essential factor of consciousness that it should begin or should be externally conditioned, but only that it should be conscious. So far as speculation goes, an eternal or unbegun consciousness is at least as thinkable as an eternal or unbegun anything; and what the fact in the case may be is certainly not to be decided by representing the accidents of human thought and consciousness as essential factors of all thought and consciousness.

And now looking away from this bad logic and psychology, and recalling the essential meaning of personality as self-consciousness, self-knowledge, and self-control, it is clear that the traditional dogma of superficial criticism on this point must be reversed. Instead of saying that personality is impossible to the infinite, we must rather say that it is possible in its fullest sense only to the infinite. The finite, because of its necessary dependence and subordination, must always have an imperfect and incomplete personality. Complete self-knowledge and self-control are possible only to the absolute and infinite being; and of this finite personality can never be more than a faint and feeble image.

We come now to the mistaken expectations and demands

referred to as sources of unsteady thought on this subject. To begin with, we must not attempt to construe the infinite spatially, whether in itself or in its relation to the world. In the next chapter we shall see that space is only phenomenal and has no application to ontological reality. With this result it follows that the world is neither in, nor out of, God in a spatial sense; and that God is neither in, nor apart from, the world in a spatial sense. The world depends unpicturably upon God, as our thoughts depend unpicturably upon the mind, and God is in the world as the mind is in its thoughts, not as a pervading aura or spatial presence, but as that active subject by which all things exist.

Again, we may not seek to construe the infinite mind, but must content ourselves with recognizing it. We have already seen the impossibility of construing our own minds. The attempt to understand intelligence as the result of its own categories has revealed itself as inverting the true order. The categories are the forms of intelligence, not its components; and what intelligence is can be known only in experience. Particularly do we need to bear this in mind in thinking of the infinite. Otherwise we shall be tempted to pass behind the absolute consciousness and feign a set of impersonal metaphysical abstractions with which to explain the living God. Our thought must content itself with recognition. Its last word must be God. As it was in the beginning, is now, and ever shall be, God is that with which all our inquiry must end.

And even the recognition is full of mystery. A thought life so different from ours eludes any but the vaguest apprehension on our part. As soon as we ask for its relation to time we begin to grope. If we eliminate time from it altogether the conception of that tideless fulness of life is hard to grasp. If we admit time into it, the thought of a devel-

oping God is a scandal to reason. And the inner life of thought and feeling, unchanging, yet without monotony; the structure of the absolute reason, also, which determines the eternal contents of the divine thought—how mysterious all this is, how impenetrable to our profoundest reflection! Whatever conception we form in this field is of the nature of a limit rather than of a veritable apprehension. We see that certain lines of thought tend to, or have their limit in, certain affirmations. At the same time we see that, however necessary they may be, they always in a sense lie beyond us. The asymptote approaches but never touches the curve.

Whatever more is to be said on this subject we hand over to the philosophy of religion. We content ourselves with discussing the general metaphysical principles which must underlie that philosophy.

Part II

COSMOLOGY

CHAPTER I

SPACE

We have confined our attention thus far to the notion of being in itself; and the results reached are valid for any and all being. We leave now these more general considerations and pass to the cosmic forms and manifestations of being. Of course we have no thought of deducing these forms as necessary logical consequences of being. Epistemology shows that there is no *apriori* road from ontology to cosmology, and that there is a large contingent element in experience. The attempt to reduce this contingent factor to logical necessity is, first, a failure so far as any insight we have is concerned; and, secondly, it shatters reason itself. We must, then, wait for experience to reveal the forms of cosmic manifestation. After this revelation, however, it is open to criticism to examine these forms with the aim of determining more accurately their nature and significance.

Our method, then, will be critical as usual. We take the common-sense theory of a world of material things in space and time as the text for a critical exegesis with the aim of seeing what changes the previous discussion and further analysis may make necessary. But in this theory space and time constitute a kind of pre-condition of the world, and of all possible worlds; or they appear as determining principles of all cosmological manifestation. The things in space and time might conceivably have been altogether different.

Many widely diverse cosmic systems are possible in thought; but for all alike space and time would be conditioning principles. This is the position which they hold in spontaneous thought; and this makes it necessary to consider them in the beginning of our cosmological study.

The present chapter deals with space, and the question is, What is the metaphysical nature of space, and how is it related to the things which are said to be in it? We exclude all inquiry into the psychological genesis of the idea as irrelevant; for the history of a notion never decides its meaning and validity when it appears. Every idea has a psychological history which might conceivably be written; but the meaning and worth of an idea can be determined only by study of the idea itself as given in consciousness. Neither the geometrical nor the metaphysical properties of space can be discovered by either physiological or psychological theorizing.

In the *Theory of Thought and Knowledge* it has been shown that space, whatever else it may be, is primarily a mental principle according to which the mind projects and relates the objects of external experience. However real space may be, it becomes real for us only as the space-law is immanent in the mental activity itself. This fact makes it unnecessary to have a real space in order that we may have spatial experience. This experience is primarily a mental product according to mental laws. We as little need a real space to see things in as we need a real space to dream things in. In both cases the spatial form is primarily a mental imposition from within, and not a passive reception of something existing without.

But to conclude from this fact that space is only a mental form would be hasty. The study of perception shows that all objective knowledge must arise in the same way.

Knowledge cannot pass ready-made into a passively receptive mind, but must arise within the mind itself as the result of its own activity. All perception is but an unfolding of the inner mental nature upon occasion of certain excitations. It is the reaction of the mind against external action. But as this fact does not warrant us in denying the object perceived, so neither does the necessity of space as a mental principle warrant us in denying that space may also be an objectively existing fact. For this conclusion we need to show that space is a mental principle and that it is absurd and impossible when conceived as having ontological existence. The decision of this question must rest upon an analysis of space conceived as something existing. If reflection upon the contents of the space-idea should reveal it to be incapable of proper existence, then, and only then, would its subjectivity be established.

The one thing which the subjectivity of space, as a principle of intuition does accomplish, is to deprive the argument for its objectivity, from the alleged necessity of the intuition, of all its force. If space be such a principle, of course we cannot intuite things apart from it; but the necessity would lie in the nature of the mental subject, and would equally exist whatever the nature of the object. The nature of our sensibility determines us to perceive vibrating objects as colored, and we cannot perceive them otherwise; but the necessity is in ourselves. On this account the argument that things are colored because we must perceive them as such, loses all weight; and on the same account the argument that things are in space because we must intuite them spatially, loses all its weight. The result is, logically, a drawn battle between the two views, even if the doctrine of the objectivity of space were self-consistent. The idealist could show that there is no need to assume an objective space to explain our intuition; and the realist could show

that the subjectivity of space does not exclude its objectivity, and that the latter view is far more in harmony with spontaneous thought. To overturn this balance of opinion and reach a conclusion, it is necessary to examine the contents of the space-idea.

And here, for the sake of the weak brother, and also in order not to seem to be manifestly raving, it is permissible to refer once more to the distinction between phenomenal and ontological reality. There can be no question concerning the phenomenal reality of space. The space and space relations are as manifest and undeniable parts of the phenomenon as the things themselves; and if the former were removed the latter would also disappear. The question must concern, not the fact of reality, but the kind of reality which space possesses. Has it only phenomenal reality, or has it in addition ontological reality? The idealist would allow the phenomenal reality, but would deny that it has any other. For him space, objectively considered, is simply the form of external experience. It is not something in which things are, but only the form of experience itself; and when the things are abstracted a real space is left behind as little as a real space is left behind when dream-objects break up and vanish. For the realist, on the other hand, space is something apart from things which holds things, or in which things exist. But for both speculators alike the spatial order of experience is an undeniable datum; and for both alike the question concerns nothing that can be given in experience, but rather, and only, the interpretation of what is given in experience.

What, then, is space objectively considered? Three views are possible. First, it is something quite *sui generis*, independent of all things, and of all that we understand by substantial or causal reality. Secondly, it is a peculiar order

of relations among things, which order, however, exists objectively and independently of any thinker. Thirdly, space is the form of objective experience, and is nothing in abstraction from that experience. Which of these views is to be held?

At first sight the first of the three views mentioned is the true one. Space is not a thing, but the place of things, and as such is a necessary condition of their existence; for things must have place in order to exist. At the same time, space is not a nothing, but a peculiar kind of existence, which can be described only in terms of itself. Something and nothing, in the ordinary sense of the terms, do not form a complete disjunction; for, besides these, a third conception, space, is also possible; and this cannot be defined in terms of the other two. This is the view of common-sense; and it seems forced upon us by the simplest experience. This view finds its expression in the oft-used phrase, that if all being were away, space would still remain with all its properties unchanged. Full or empty, space remains the same, changeless and eternal. For though space conditions being, being does not condition space. When the intuitionist is looking around for a striking illustration of the impossible with which to confound the empiricist, he often lights upon the statement that God himself can neither make nor unmake space, or do other than submit to its necessity. The proposition frequently recurs in philosophy to regard space as a datum objective to all being, and with which being must get along as best it may. Space is not a system of relations, for relations are changing while space is changeless. It is not a property of things; for it is independent of things. It cannot be identified with any actual form, for it is rather the formless principle of all form. It is the mysterious background of forms and relations, and is identical with none. In this view, which is the view of

common-sense, space appears as a fathomless and independent necessity, to which even the basal reality must submit.

At first sight, this view is sun-clear, but on closer inspection it is seen to be full of difficulty. The clearness is due entirely to confounding the phenomenal and the ontological. The space-law is the same for all phenomena, and remains unchanged through all their modifications. Hence it is easy to abstract it from phenomena as something by itself, independent, all-embracing, and eternal. And as the phenomenal application is always perfectly clear, we fail to notice the grievous difficulties in which this notion of a real and independent space involves us. If we should tell one to meet us at such a time and place, not even the wayfaring man would have any difficulty in understanding us. This is the phenomenal side of the matter. But if we abstract the ideas of time and space from the phenomena of which they are the form, and consider them as entities by themselves, then, as Berkeley has it, we are "lost and embrangled in inextricable difficulties." This is the ontological aspect of the case.

To begin with the difficulties in the case of a real space, the conception of space as an all-containing form is an inconsistent metaphor borrowed from our sense-experience. Forms must always be the forms of something; and when there is no reality to produce and limit the form, the form exists only in conception. When one vessel contains another, it is not the form which contains, but the vessel; and if we cancel the reality of the latter there is no more containing. To the conception of containing there is necessary the thought of a limit, either real or conceptual; and without this we have only an inconsistent imagination. The fancy is due entirely to the fact that the spatial synthesis applies to all phenomena, and this is mistaken for a form which holds them.

Again, the asserted reality of space cannot be maintained without conflicting with the space intuition itself. For space as real must come under the law of reality in general; that is, it must be able in some way to assert itself as a determining factor in the system of things. No matter how nameless or ineffable a substratum we may assume for space, this demand cannot be escaped. Unless we endow space with activity and regard it as a peculiar something in interaction with other things, the affirmation of its existence becomes absurd; and its existence would be in no way distinguishable from its non-existence. But if we do thus endow it, the affirmation becomes equally absurd; for to view space as active and possessing causal efficiency would be a grievous affront to common-sense, which holds that space is not a thing, but the place of things.

But if space have no effect upon things, and if there be no reciprocal determination between space and things, we are quite at a loss to know in what its alleged reality consists, and what the relation may be between space and things. That which does nothing, determines nothing, neither acting nor being acted upon, most certainly is nothing. If we set out to define or give the marks of nothing we could find no others than just those mentioned as the marks of space.

And here, very possibly, some one may say that space is nothing. Well, then, why maintain its existence? Does the nothing, the non-existent, nevertheless exist, and have three dimensions and divers geometrical properties? The respondent would be far from allowing the identity of the space-nothing with the thing-nothing or the mathematical nothing; and this proves that, while he calls space nothing, he still has some indefinite positive existence in mind, which is distinct from pure nothing, and which has peculiar properties of its own. For if we view space as pure noth-

ing it is plainly absurd to affirm its existence, to endow it with properties, and distinguish it from other nothings. And yet if space does nothing and determines nothing, in what does its reality consist?

Now to this question, and to the other concerning the relation of things to space, common-sense has an answer. The reality of space consists in its being just what it is seen to be, unbounded room for things; and the relation of things to space is equally simple; they are in space. Nothing could be more manifest or less mysterious.

So it seems, no doubt, so long as we fail to distinguish between the phenomenal and the ontological stand-point. Space and space relations are perfectly clear as phenomenal; they express the general form of objective experience and the relations which obtain among our objects. But as phenomenal they have only mental existence, and our inquiry concerns a supposed ontological space. And we ask what is its metaphysical nature, and what is the metaphysical relation between this real space and the things said to be in it? And to these questions there is no answer which does not either conflict with the space intuition itself or else deny all real relation. If we endow space with efficiency we outrage common-sense; and if we do not thus endow it we deny all reality to space itself and all real relation between it and things. Thus we become "lost and embrangled in inextricable difficulties" in our search for a real space in distinction from the apparent order of experience.

And the further we go the worse we fare; for the inner structure of this supposed real space teems with unmanageable paradox. It is easy to say that space is one, but it is not so easy to say in what its unity consists. Ontological unity, we have seen, is possible only to intelligence; and the unity of space, for thought, depends on the possibility of comprehending all our phenomena in a single

scheme, and of uniting all diversities of position in a related whole. But this unity exists for thought only, and only through the mental synthesis itself. But in the real space apart from mind, this synthesis is lacking; in what, then, does its unity consist? The fact is, it has none. The law of space is the mutual externality of every part to every other. Space exists only as the parts exist. They are the realities and it is their sum. But what binds them together into a whole? What determines their mutual positions and fixes them in changeless relations? If this were done by thought it would be intelligible, but it is altogether unintelligible when supposed to be done apart from thought. To posit a dynamic relation among the infinite positions, whereby each prescribes its place to every other, would be monstrous; and a logical relation is meaningless apart from thought.

A second difficulty with the doctrine which regards space as real, apart from things, is that it leads to a hopeless dualism of first principles. If space be a reality apart from things, it is something uncreated and eternal. No one would be hardy enough to maintain a proper creation of space conceived of as an infinite void, for no meaning can be attached to the phrase; indeed, the idea itself negatives creation. Those speculators who have taught a creation of space have generally abandoned the common conception, and regarded space as a system of relations, or as a property of things. In such a case, the creation of the things would be the creation of space. But the common notion of an independent space is repugnant to creation, for the necessity would ever pursue us of positing a previous space for the reception of the created one. Accordingly, spontaneous thought has always regarded space as one of the eternal and self-existent necessities which even God himself cannot escape.

But this view is contradicted by the necessary unity of the basal reality. English and American thinkers, in general, have paid very little attention to the general problem of knowledge; and hence they have had little hesitation in allowing any number of independent principles. Many have proposed to view space and time as mutually independent, and as equally independent of God; and now and then a speculator proposes to add matter to the list. Indeed, the materialists generally view space, time, and matter as mutually independent and self-sufficient existences. But we have seen, in discussing the relation of the infinite to the system, that all principles and all manifestation alike must flow from the infinite, and that the infinite must be one. If we should posit anything aside from the infinite as alike independent, the second something could not manifest itself in our system without an interaction between the two. But this would make them both dependent, and would force us to assume some other being, deeper than both, as their common source or foundation. We cannot, then, view space and being as mutually independent; for in that case being and space must be in interaction, if space is to affect our system. But this would destroy the independence of both, and would also make space an active thing, and not space.

It is conceivable that some person should still be found who might think it enough to say that the only relation between space and being is, that being is in space; but if they be mutually independent, existence in space can have no significance for being. Both being and space would go on in complete indifference, and there would be no possibility of communication between them. In that case no meaning whatever could be attached to the proposition that being is in space. But it is absurd to speak of being as dependent on space, and hence we must view space

as dependent on being. Further, it is impossible to view space, conceived as extended emptiness, as created or dependent. Hence space cannot be viewed as such emptiness, but must be in some sense a principle in being which is the root of spatial manifestation. Instead of saying, then, that being is in space, we must rather say that space is in being. It is strictly impossible to regard space as a self-existent reality, for the conclusions reached in the ontology make it impossible to posit more than one basal and independent existence. All else is a consequence of this one reality, either as a creation or as a principle of activity and manifestation. But space, as commonly conceived, admits of no creation. If, then, the popular thought has rightly grasped the contents of the space-idea, we can view space only as some principle in being.

The above conclusion is drawn from the impossibility of having more than one fundamental existence. It results also from a consideration of the unity of being. If space be a real objective existence, then the infinite, or rather God, is in space, and possesses bulk and diameter. For whatever exists in space must exist either as a point or as a volume; and as no one would think of ascribing a punctual existence to God, there is nothing to do but to ascribe volume. But nothing possessing volume in space can be a unit. Points and component volumes can always be distinguished in the volume of such a thing, and thus the thing appears as made up of parts. But such a conception applied to the infinite cancels both its unity and its omnipresence. That which is omnipresent in space cannot be extended in space, for such extension would imply merely the presence of the being part for part, or volume for volume, in the occupied space. Philosophy cannot reconcile the necessary unity of the infinite with existence in space, and theology cannot reconcile its conception of the non-spatial mode of

the divine existence with existence in space. But if space be real it must be infinite, and God must exist in space, and the indicated conclusions must follow. These conclusions apply especially to Newton's and Clarke's conception of space. They, in effect, made it an attribute of God; and Clarke framed a theistic argument on this conception. But this view simply affirms extension of God, and leads to the difficulties mentioned.

On all these accounts, therefore, we hold that space cannot be viewed as a real existence. Its reality is incompatible with the unity of being, and with the unity of all principles in one fundamental being. To maintain its reality, we must despatialize it, and make it an active thing; and thus we conflict with our space-intuition, which at once demands a second space to contain the first. Finally, we cannot bring space, and the things which are said to be in it, into any articulate relation without positing an interaction between them. Thus we fall back into the previous difficulty, and despatialize space. The declaration that space is real, and that things are in it, which seemed so sun-clear, turns out, upon inquiry, to be in the highest degree unclear and untenable.

These difficulties have led many thinkers to abandon the common notion of space for the second view mentioned—that space is a certain order of relations among realities. They allow that space apart from things is nothing, and hence that, if things were away, there would be strictly nothing remaining. But things, when they exist, exist in certain relations, and the sum, or system, of these relations constitutes space. Things, then, do not exist in space; but they exist in space-relations, and with space-properties. These relations and properties are the constituents of the space-idea, and by abstraction from them we come to the

notion of a single unitary space. But while space is thus dependent upon things, these relations and properties of things are quite independent of our thinking. This view, then, agrees with the preceding one in regarding these relations as independent of the mind and as objectively existing among things.

If this view were correct we should have no unity whatever in space; for the space relations of things are perpetually changing, and thus space itself is perpetually becoming something else. It also makes no provision for the myriad ideal and possible space relations which are implicit in the space intuition, but are not realized. All of these would have to be handed over to subjectivity as having only mental existence; while the real space would become a variable thing without any unity or continuity whatever. Moreover, the view has some very curious implications. A single thing could not be in space at all; and any system of things which always maintained the same relations would be in the same space. Our solar system, conceived by itself, would always be in the same space, so long as the same relations of its members were maintained. Either, then, the whole system could not move, or, if it did move, it would still be in the same space. Following out this line of thought, we should come upon some unusually hard and dark sayings.

But the view is untenable in any case; for formal relations are incapable of real existence. It might conceivably be contended that relations of interaction may exist apart from thought; but formal relations exist only in and through thought. And as it would hardly occur to any one to attribute causal efficiency to space relations, we can only conclude that they are formal relations, and as such are necessarily subjective. Hence, if space be only a system of relations, it is purely subjective; and thus the view passes

over into the third one, which makes space only phenomenal.

This subjectivity of formal relations is easily misunderstood through a pardonable oversight. There are many relations among the objects of thought which are seen to be universal; and because they do not exist for one more than for another, we say that they exist independently of the mind. Thought or unthought, the relations exist among the realities; and the realities are really related. This fact we seek to express by saying that the relations themselves are independent of all thought. But all that we can mean here is to affirm the universality of the relation. There is a great difference between being independent of our thought and being independent of all thought. And when we ask what the ontological fact is underlying a formal relation when abstracted from all reference to a constitutive intelligence, there is strictly nothing to be found. However relatable things may be in themselves, they are related only in the relating act of thought; and that relatability also, if pursued, would be found to refer back to thought somewhere for its origin and meaning.

This subjectivity of relations, however, must be carefully distinguished from any doctrine which makes them individual or arbitrary. It allows the possibility that objects of thought may be so constituted that in clear thought only certain relations can be instituted, as in the case of number and geometrical figures. The relations, while subjective, may be also necessary. It is equally possible that the objects of thought may be such that whenever they are conceived by any intelligence anywhere the same relations shall be instituted. The relations, while subjective, may also be universal. It follows only from this subjectivity that it is absurd to speak of relations as objectively existing. And what is thus true of relations in general must be true

also of space-relations. In so far as space is a system of relations, in so far it has only a subjective existence. If space-relations are to have objective existence, they must be more than relations; they must be a series of interactions among things. But in that case we should deny the indifference of things to space, and fall back again into the view which makes space active. We must then dismiss the doctrine that space is a series of objective relations among things which exist independently of thought. Space is neither a real thing nor an ontological predicate.

The two first views of the nature of space proving untenable, we seem shut up to the third, which makes space a form of intuition, and not a mode of existence. According to this view, things are not in space and space-relations, but appear to be. In themselves they are essentially non-spatial; but by their interactions with one another, and with the mind, they give rise to the appearance of a world of extended things in a common space. Space-predicates, then, belong to phenomena only, and not to things in themselves. But while shut up to this view by the failure of the others, we seem shut out from it by its own overwhelming absurdity. Certainly, before the doctrine can be made to seem anything but the most grievous outrage on common-sense, the paradox must be explained away, or at least relieved; and this we now hope to do. The chief difficulties are due to a swarm of misconceptions, which have clustered around the doctrine; and a large part of the argument for its validity must consist in removing these misunderstandings.

In the first place, the doctrine is commonly made to mean that our space-intuition is something arbitrary, and without any determining factor in the world of causality. The mind is conceived as standing with its space-forms waiting to impose them upon reality without any regard whatever

for the peculiar nature or circumstances of reality. These forms are purely external impositions, and might as well have been anything else whatever. They are the mental spectacles through which the mind looks, and, for all we know, other beings may have altogether different spectacles. This doctrine of the spectacles implies absolute nescience and universal relativity of knowledge; for, of course, we cannot tell how things would look if the spectacles were off; nor how things may look to other beings who may have different spectacles.

But the obnoxious feature of the doctrine is that the spectacles are viewed as having only an arbitrary relation to reality, and hence one which might as well be changed as not. Even Kant, the first pronounced teacher of the ideality of space, is chargeable with this misunderstanding and extravagance. Doubtless many passages could be adduced which would show that he viewed the order and sequence of phenomena as objectively determined; but in so doing he was inconsistent with his own doctrine of causation, which denies determination to things in themselves; and, besides, the conception of the mind, as arbitrarily related to things, incessantly reappears. The result is that his theory of perception breaks down in the attempt to bring the mental form into use. The mental form is compatible with the most varied applications. In itself it does not determine whether a given object shall appear as a cube or as some other figure; and there is nothing in Kant's exposition which supplies a principle of discrimination, or makes the choice between the various forms other than arbitrary. The disciples of Kant were more oblivious of this difficulty than Kant himself, and in general they left the application of the mental form to pure chance. It was necessary, therefore, that the system should pass into the subjective idealism of Fichte.

But the human mind has no such liberty in the use of its subjective forms. The positions and relations of things in our subjective space are independent of our volition; and their spatial changes take place without any consent of ours. The source of their movement and the ground of their relative arrangement are not in us alone. The subjective image of things in space at any point and time is a fixed one. We cannot exchange the right for the left, the up for the down, the far for the near. Least of all can we eliminate the idea of distance from our subjective space, and think of things as equidistant from ourselves or from one another. The same thing has happened with the subjectivity of space as with the subjectivity of sense-qualities. It is very common, when the beginner in psychology has learned rather than mastered the latter doctrine, to hear him affirming that they are nothing but mental affections, in complete ignorance of the fact that, while subjective effects, they still have an objective cause, which, though not like them, nevertheless determines them. In affirming the subjectivity of space we have equally to admit something beyond ourselves which is a determining factor in our spatial experience.

This objective factor may be conceived in two ways. We may regard it as a non-spatial system with which we are in interaction; or we may regard it as God himself, who is reproducing in finite thought the order which exists in his infinite thought. In the former case we can affirm the subjectivity of space only in the following form. The relation of things to us is such that when they strike upon our senses they produce certain sensations of light, heat, and sound. These sensations, however, are not copies of anything objective, but are the subjective symbol, or translation, of certain phases of the object. Now in the same way things and their unpicturable interactions are such that they produce in perceptive beings an intuition of space,

which intuition, again, is not a copy of anything objective, but only the subjective symbol or translation into the forms of sense-intuition of unpicturable realities beyond them. The intuition, however, is not independent of the realities, but for each change in the latter there is a definite change in the former. Just as a rise or fall in the rate of vibration is attended by a rise or fall of the tone heard, or the color seen, so any change in the metaphysical interactions of things is attended by a corresponding change in the apparent space-relations. Or as the dark ether tides flash into a sphere of light when they strike upon an eye, so the ineffable tides of cosmic causality, when they strike the soul, appear as a world of things in space and space-relations. The subjective intuition has its objective ground; but that ground, though unlike its mental translation, yet stands in certain definite relations to it, so that a given state of the object allows only one space-translation, just as a given rate of vibration can be heard only as one tone. This fixed connection between reality and its spatial phenomena allows us to deal with the latter as if they were real objects, and to predict their course with as much certainty as if they were things in themselves. It produces the same reign of law among phenomena and the same possibility of prevision which would exist if phenomena were things. Mechanics and astronomy run no risk of being falsified or displaced by the subjectivity of space.

This is a possible view of the subjectivity of space, but it cannot be regarded as adequate in this form. There is in it an assumption of impersonal finite agents, and this we have come to regard as a great heresy. The view arises from approaching the subject from the side of causality before we have raised causality to the volitional and intellectual form. For us, apart from the finite spirit, there is nothing but the infinite mind and its activities; and the

objective determining ground of our space order must be sought here rather than in any unpicturable finite existence. In this view the impersonal and non-spatial finite falls away entirely as a reality by itself, and leaves only the infinite agency and the phenomena it produces. This gives an entirely different aspect to the whole question, as will appear in the discussion of the next objection.

A second misconception is that this view makes space a delusion, and thus destroys all confidence in the mind. This error has several roots. The first is the failure to distinguish between phenomenal and ontological reality; and a second is the confounding of subjectivity with delusion. The first point has been sufficiently referred to already. No one proposes to deny the phenomenal reality of space or its universal validity in our experience. Doubt attaches only to that ontological space of traditional dogmatism; and on this point experience can decide nothing.

The second confusion rests upon an easy oversight of spontaneous thought concerning the relation of mind to reality. In all of our objective knowing we seem to be dealing with a reality which was there before we thought about it, and which is quite independent of our thought. Thus we are easily led to think of mind as non-essential to reality, as adding and constituting nothing, and as at best only copying a reality which would exist just the same, if all mind were away. The theistic realist would of course admit that the reality had its origin in the divine thought, but he would find no present function for that thought beyond knowing things existing in their own right beyond it.

But while the origin of this notion is obvious, and while spontaneous thought should not be blamed for resting in it, it becomes an uncritical prejudice when advanced as a speculative dogma. It has long been one of the great questions of philosophy whether mind can be viewed as thus super-

fluous, or whether, on the contrary, reality can have its full existence anywhere but in mind. Epistemology shows that nothing can exist for mind which does not have its root in mind. And logic shows that reality is unintelligible and impossible except with reference to mind. Every definition of reality which is not reality for mind either shatters on the rocks of the Eleatic Scylla or is ingulfed in the whirlpools of the Heraclitic Charybdis. The conception of extra-mental existence is simply a shadow of our conviction that our objects are not created by us; and this independence of our mind is mistaken for an independence of all mind—a notion which destroys itself. We conclude, then, that subjectivity, in the sense of dependence on mind, is universal; and that objectivity, in the sense of non-dependence on mind, is a fiction, a shadow of crude thinking.

Now from this point of view the subjectivity of space is far enough from making space a delusion. For spontaneous thought all our objects are real in an extra-mental sense. The confused synthesis of experiences which makes up the world-view of common-sense is regarded as alike real and as real in the same sense. And when criticism begins, the true question is not whether this mass of raw material be real, but what kind of reality it possesses, and whether different parts have not different kinds of reality. And the inquiry once started, we soon find ourselves compelled to disturb the uncritical rest of common-sense. The entire world of sense-qualities is first discovered to have no extra-mental and ontological existence, but only a phenomenal reality. They do not thereby become unreal and delusive; for all that was ever true of them remains true of them still. Their nature and relations are undisturbed; and their immense significance for our practical life is as undeniable as ever. We have learned not that they are un-

real, but that they have their reality only in and for mind. And this reality for mind is not only a very important kind of reality, but when we look closely into the matter we find ourselves somewhat at a loss to discover anything more real this side of the spiritual causality on which all finite reality depends.

In the same manner, when we come to consider the spatial order of things, we discover not that it is unreal, but that it is real only for mind. But it does not therefore become a delusion. Space is still the form of our objective experience, and is as law-giving for that experience as ever. It is not then a delusion; for all that was ever true of space and space-relations, and of objects in space-relations, remains true still. We have merely discovered that there is something deeper than space, and that spatial phenomena are nothing in which we can rest as ontologically ultimate, or as existing apart from mind. Apparent reality exists spatially; but proper ontological reality exists spacelessly and without spatial predicates. And this conclusion is not forced upon us against reason, but by reason itself. We do not deny the truth of appearances as appearing. They furnish the starting-point but not the stopping-point; for we find in the appearances themselves the necessity of going behind them to something which, though their ground, is still without the predicates of the appearances. Whoever will bear in mind that reality as it exists for reason does not contradict reality as it appears will see that there is nothing sceptical in the conclusion, provided it be solidly deduced. On the contrary, the refusal to go where thought points is the true and only scepticism.

Well, then, is the real world spatial or non-spatial? That depends altogether on what we mean by the real world. If we mean the world of experience, it most certainly is spatial. If we mean a world of ontological substances other than

spiritual existences, it certainly is not spatial. But it is permitted to doubt whether such a world exists. Experience reveals the apparent world, and reflection shows its phenomenal character; but reflection also shows that for the explanation of this world we do not need a noumenal world, but rather the infinite and its unpicturable causality. The noumenal world behind the apparent world, trying to peer through it but hopelessly masked by it, is something for which speculation has no longer any use. Nor may we call the causality on which the apparent world depends the real world; for that causality finds its meaning only in the apparent world which it founds. In abstraction from this effect which it realizes, we can make nothing of it whatever. And thus, in a very important sense, it appears that the apparent is the reality of the non-apparent.

The source of these paradoxes, which we seem to have been heaping up without conscience or remorse, lies in the attempt to define reality without reference to intelligence. The real world, we fancy, is not the apparent world, for that is phenomenal and exists only for intelligence. The real world, then, is the noumenal world of impersonal things in unpicturable relations of interaction. Into this world we cannot enter by any spatial intuition; only the pure reason can gain admission here. Luckily, the pure reason, before seeking admission, bethinks itself to examine the notion of this world; and then it turns out that this world, if it exists, does so only in and for intelligence. All such reality is constituted by intelligence, and has no meaning apart from intelligence. In this sense this noumenal world is phenomenal, and yet, unfortunately, it is not phenomenal to any assignable percipients. From this stand-point the so-called noumenal world begins to take on a fictitious look, while the phenomenal world is as undeniable as ever. And,

indeed, as soon as we see the impossibility of defining the reality of things except with relation to a constituent idea and a constituting intelligence, phenomenal reality is all we are permitted to look for in the world of things. Thus the apparent world becomes the only world there is, and is just as real as it proves itself to be. To be sure, it has not ontological existence, but it is the seat and substance of practical experience. And when we aim to explain it we are not to look for a fictitious noumenal world, but rather for its substantial cause and ground; and this cause must be non-spatial.

These considerations go a long way towards saving the truth of appearances. We are not in a world of illusions and fictions; we are rather in the world of mind. And in this world the space order has its place and value. Moreover, the demand to think of ontological reality as without relation to space is, after all, not so foreign to our thought. We have only to reflect upon our own existence to see that in any case space applies only to the objects of sense-intuition. It never occurs to us, at least when thought is fairly critical, to give the inner life spatial predicates. We think of our thoughts as neither in the soul nor out of it, but only as dependent upon it. We do not think of them as to the right or the left, above or below one another, but only as co-existent and sequent in logical relations. In the same way we think of the fundamental being which we have been forced to posit, as without form of any kind; and we think of the finite, spatial and non-spatial alike, as existing in it as non-spatially as our thoughts and feeling exist in the mind. And as the soul and its products cannot be pictured in their proper existence, so the infinite and its products cannot be pictured in their proper existence. In thinking in this field we must use concepts and not images. We also point out once more that if we do view space as

ontologically real, the infinite itself must be viewed as spatial, and thus would disappear altogether. There is no way of maintaining the unity and reality of the infinite apart from the essential phenomenality of space. On this point popular thought has attained to no consistent conception. Once in a while a speculator can be found who maintains that all things, finite and infinite, material and spiritual, are in space; but in general the tendency has been to limit space to material things only. But there has been little effort to reconcile the non-spatiality of spiritual existence with the ontological reality of space. Indeed, their incompatibility is the unsuspected source of most of our materialistic speculation.

Shall we say, then, that space is the form under which we intuite objects? There is no objection, provided we do not conceive the objects as something apart from the intuition and as warped by the intuition into forms foreign to their true nature. These "things in themselves" are myths engendered by the Kantian epistemology, which still held the fancy that there can be reality which is not reality for intelligence. This fancy, combined with the phenomenality of space, gave the unknowable noumena as a matter of course. The phrase proposed becomes less misleading if we change it to read that space is the form of objective intuition, or the form of objective experience. At the same time we maintain its strict phenomenality. Neither the mind nor things are in space; we have experience under the spatial form. And this spatial experience, considered as a mental event or form of psychical activity, is non-spatial. To ascribe spatial properties to it would be as absurd as to say that the thought of length must itself be long or the thought of fire must be hot.

When we are considering the space world as object we are not to view it as a translation of reality into forms of

appearance. It is simply what we find it to be. But when we consider it from the epistemological stand-point, then it is permitted to use this metaphor of translation. For the knowledge of space arises in the mind through a spaceless reaction against spaceless affections of the sensibility. Moreover, the world itself as product rests continually upon the producing energy of the infinite. In this system of activity we have our place; and in the inductive sense we are in interaction with it. And out of this unpicturable dynamic relation arises the stimulus to all objective knowing. Space itself is not a translation, but our knowledge of space is not improperly called a translation of dynamic relations into forms of appearance.

Some final misconceptions may soon be warded off. It is not to be expected that daily language should be modified to suit this view; indeed, if it were, it would almost certainly be false; for daily life deals only with things in intuition, and space is a form of intuition. It is only when we pass into the ontological realm that we must drop our space-conceptions. It would be absurd pedantry to refuse to say that the sun rises and sets, and yet when it comes to an ultimate explanation we must forsake the phenomenal stand-point and put ourselves at the centre. It would be excessively tedious and stupid if, instead of calling a thing red or green, we should say that it emits vibrations of a certain length. When dealing with phenomena, phenomenal language only is in place. Yet even here it is at times necessary to drop our phenomenal expressions and deal with the fact in thought-terms. So also in metaphysics we use and must use the language of space in dealing with phenomena; but when we seek for an ultimate explanation we are forced to abandon this language as having only phenomenal application.

Yet, after all, it will be urged, this view is totally foreign

to the appearance. Of course it is, and no one denies it. Space as the form of appearance can never be emptied out of appearance. It is a complete misconception of our aim to suppose that we are trying to intuite things out of space. Any attempt to construe the doctrine to the imagination must necessarily fail; for space is the form of the imagination. All such attempts are excluded by the terms of the doctrine, and hence involve a misunderstanding of it. We cannot, therefore, pierce behind space by the imagination which is limited to the forms of space, and tell how the non-spatial realities look in their non-spatial existence. They do not *look* at all. Pure thought only can enter that unimaginable realm, and with its non-spatial categories determine how we shall think of the unpicturable reality which founds all relations and all appearances. When, then, one asks, Are all things together in space? or when I seem to be moving am I really sitting still? he shows thereby that he has not grasped the doctrine, and he even awakens the suspicion that he may not be entitled to any opinion in this matter.

It will be further urged that this is not the impression which experience makes on spontaneous thought. But what of that? Spontaneous thought is busied only with things as they appear; and space is real in appearance. Moreover, there is scarcely a single doctrine of science, from the theory of matter to the theory of astronomy, which agrees with the impressions of spontaneous thought. If our senses rightly report to us the phenomenal world, and make a platform on which life can go on, we can excuse them if they do not give us the ultimate metaphysical truth. For practical purposes they give us something a great deal better; and sane metaphysics when it comes does not discredit the senses, but only the hasty inferences based upon them. In truth, it is not a case of sense against reason, but

of one system of metaphysics against another; both of which must find their raw material in sense itself.

A final objection is drawn from epistemology. Subject and object, it may be said, form a necessary antithesis in thought; and the object is external to the subject. And what do we mean by the external world, a phrase which the idealist himself is compelled to use, but a world outside of the subject? The subject is here, the world is there, yonder, all about us. No amount of speculative hasheesh can long blind us to this fact; and so long as this fact remains, the subjectivity of space can never be more than an idol of the speculative den.

The objector is earnest, but, however full of sweetness, is somewhat lacking in light. To begin with, he seems to confuse his body with himself; and as he finds the body to exist in spatial relations to other bodies, all of which as spatial are mutually external, he apparently fancies that objects are spatially outside of the subject. This conception, if it were valid, would make knowledge altogether impossible. The truth is, the relation of subject and object is absolutely unique and can only be experienced. It admits of no spatial representation.

As to what we mean by the external world, the idealist has an easy answer. It may mean the order which is independent of our thought. It is the not-self, not in the sense of existing apart from all mind, but in the sense of being independent of us. Or it may mean, and in this connection it would mean, those factors of our experience to which we give space relations. Some elements of experience have the spatial form, and some have only the temporal form. It is this fact which underlies the distinction of internal and external in psychology; but we reach nothing extra-mental in this way.

There is a deep-lying mystery here whose implicit but

unconscious presence is the source of much of our uneasiness in this matter. Without a common-to-all, knowledge breaks up into self-destructive individualism; and to found this common-to-all, we seem to need a common object. And then, in order to secure its identity in itself and its existence for all, nothing seems so promising as to plant it in one space where everybody may have free access to it. Thus the identity and community of the object are secured and insured, and knowledge is made possible.

This view is clear because it admits of being pictured; and its hopeless absurdity is revealed only to critical reflection. And reflection has nothing to put into its place which will compare with it for easy understanding. The world is one only for and in the divine thought; and the world has its place, not in space, but in the divine mind. And our theory of knowledge must ultimately run back to the divine thought and will for its definition of reality, for the unity and identity of the object, and for the possibility of knowledge in general. Thus we are introduced to a world of unpicturable relations and of impenetrable mystery, in comparison with which the sense-view is sun-clear and self-evident; that is, in advance of reflection. And yet, after all, this difficult view turns out to represent the line of logical least resistance, when thought becomes critical and reflective. And if it seems to suggest Malebranche and the vision of all things in God, it is none the worse for that.

And now that the question is raised, it seems well to come to some definite understanding on this matter of phenomenal knowledge. From the stand-point of the sense-bound philosopher, phenomenal knowledge can hardly seem to be knowledge at all, but only a recitation of individual experiences. Phenomena as such are only in the mind; and when many persons perceive the same phenomena there is no more objectivity than when many persons dream the

same dream. We might possibly get on with the phenomenality of sense-qualities, because, though subjective, they may be related to real and common objects in space. But when these objects are also made phenomenal, then all reality, community, and identity of the object disappear; and nothing is left but a multitude of individual dreams, more or less overlapping and coincident perhaps, but having no other connection. To this failure and overthrow of real knowledge the phenomenal doctrine must come.

We touch here upon a real difficulty and a profound mystery. At first sight the objections urged seem conclusive; and there appears to be no way out, except to put the real objects back into real space, and let every one come forward and know them as they are. Only thus can the reality and identity of the object be secured.

So it undoubtedly seems, but the matter grows obscure upon reflection. In the first place, the phenomenality of sense-qualities is not so easily conceived, and yet it must be admitted. The notion that, apart from eyes and ears, the world is neither dark nor light, neither sounding nor silent, is fairly hard to realize. And we are not much helped in the realization by being told that the things are really there, only they are altogether different from what they appear. "Transfigured realism" is a broken reed. The distinction of primary and secondary qualities will not work. But if we can have an experience of a common-to-all in sense, even when there is no extra-mentality in the object, we might equally have it in connection with spatial phenomena in general.

The real problem here divides into two. First, can we have an experience of an order, or of thought contents and relations, which shall be valid for all? Secondly, how can we have such experience? The first is simply a question of fact; and the answer must be in the affirmative. To the

second question no answer can be given. We do not know how we reach the common-to-all; we only know that we reach it. This is the deep mystery which is involved in the community of finite minds; and its solution must finally be sought in the realm of the infinite.

But to the second question common-sense thinks it gives an answer. This illusion is due to picturing the object in space with other bodies about it which represent the knowing subjects. With this image well in mind, it is easy to see how they all have the same object; for they are all gathered round the object and everybody sees it to be one and the same. But this delusive clearness disappears when we remember the process of perception. We never can get nearer the object than our thought will carry us; and the object exists for us as anything independent of our thought only through the rational necessity we find of positing the object as an independent and universal content. This necessity is the bottom fact in the case; and it can be referred to nothing else. But this is quite as possible with the experience of phenomena as with any other. The identity of the object is not secured by having a real thing in a real space, but only by its being a factor of that rational world which is the meaning and substance of the phenomenal world, and which is the presupposition of every theory of knowledge which understands itself and its problem.

We have now to decide between the views of space. In any case, space must be a principle of intuition. One fact, which makes the objectivity of space so unquestionable to unreflective thought, is that we have apparently an immediate perception of its existence, so that our perception of space is as direct and immediate as our perception of things. On the other hand, it is made an objection to the subjective theory that it implies a deal of mental mechanism and men-

tal activity of which we are totally unconscious. Both positions are worthless as arguments. The apparently immediate perception of space is, in any case, the result of non-spatial activities. The existence of space would not account for its perception. We must in some way be affected by it. But space itself does not act upon the mind; only things do that. Hence our knowledge of space is a mental interpretation of the action of things upon the mind. In this action, spatial properties are displaced by varying intensities of activity, and these variations are translated by the mind into space-terms. These considerations show that our space intuition must in any case arise within, and that the objective space is no factor of sense perception whatever. There is no need of the real space to explain our experience.

But we have further seen that the realistic view is inconsistent, and upon analysis even unintelligible. It hovers between making space something and nothing, and both views are absurd. It also conflicts with the unity of being, and forces us to regard the infinite as composed of parts. Finally, it implies a hopeless dualism of first principles, in that it implies the coexistence of two necessary and mutually independent principles. But this view is strictly impossible, and any doctrine which leads to it must be rejected. The attempt to regard space as a system of relations between things we found to be an impossible compromise between the subjective and the objective view. The objective existence of space, then, is not only not proven, but it is in itself unclear, inconsistent, and impossible. We reject it, therefore, for the view that space is ultimately a principle of intuition, and, secondarily, a mode of appearance. But though subjective, it is not arbitrary or individual. A given state of being may allow of only one space-translation, and this translation may be universal and changeless in all intuition, whether divine or human. However that may be, the

universe can have its spatial properties and relations only in the mind, which not only belongs to the system, but is both its foundation and its crown.

So, then, space is phenomenal. It is not a boundless void in which things exist, but only the general form of objective experience. But all that was ever true of it is true still; and the laws of space are as binding upon us as ever. We cannot slip into the non-spatial and get about without moving. We may still go on making appointments to meet at any given place, and there will be no obscurity about our meaning. Within the phenomenal, space relations have the clearest possible meaning. But when we abstract them from things and set them up as realities by themselves, we are "lost and embrangled in inextricable difficulties."

The relation of the infinite to space calls for brief mention. We have affirmed that space, as the form of intuition, may exist for the infinite as well as for the finite; and this may easily be mistaken for a limitation of the infinite. But this would be to confound space as principle with space as limitation. For human beings space has a double aspect. It represents not only a principle of intuition, but also a limitation of our agency. The organism which conditions our mental activity has space relations, and thus we naturally appear to be located and limited in space. But this location is of the organism only, and this limitation is only the result of our dynamic limitations. It consists solely in the fact that our immediate action upon reality is limited. Far and near are terms which depend entirely upon the amount of mediation necessary to affect any given reality. Wherever we act immediately, there we are; so that, instead of saying we can act only where we are, we ought rather to say we are wherever we act. But our immediate action extends to only a few things, and this fact appears as spatial limitation. In this sense of limitation, space cannot be af-

firmed of the infinite. It comprises all reality in the unity of its immediate activity, and hence is everywhere. For by omnipresence we can mean nothing more than this immediate action upon all reality. The conception of omnipresence as a boundless space-filling bulk is a contradiction, for that which is in space and fills space cannot be omnipresent in space, but different parts must be in different places. Each part, then, would be in its own place and nowhere else. Thus the unity and omnipresence of the infinite would disappear.

This modification of the spatial judgment by our organic experience introduces a large element of relativity into it. It is only the pure spatial judgment, as in geometry, which can be regarded as universal. All beyond that is affected by the general limitation of the finite and by our organic connections.

Our general view of space can hardly fail to suggest the much-debated question concerning the dimensions of space. Of late years the claim has often been made by mathematicians that space may not be restricted to three dimensions, and elaborate discussions have been made of the properties of non-Euclidian space. The most curious conclusions have been drawn as to what would be true in such spaces, and the impression has become very general that the conception of space as having only three dimensions is mistaken. We have now to inquire whether the principle of space is such as necessarily to restrict it to three dimensions.

The principle of space has no such universality as the laws of formal thought. These condition all our thinking, but the principle of space conditions only our intuition of objects. We must further allow that all forms of external experience are not alike calculated to awaken the mind to react with a spatialization of its objects. We must also ad-

mit that our nature may contain mysterious possibilities which are at present entirely hidden. It is, then, possible that, under certain forms of experience, the mind would never come to the space intuition. It is equally possible that, under other forms of sense-experience, the mind should arrange its objects according to some altogether different principle, so as to have a new form of intuition. This new form, however, would not be space, but something quite peculiar. As such, it would be related to the space-intuition, as our sense of color is to that of sound. This, of course, is a mere logical possibility, but there is certainly no ground for saying that the space-intuition is the only one possible in the nature of being. If there were any ground for affirming the existence of such a new form, there would be nothing *apriori* incredible in it. It is entirely possible, however, to hold, along with this admission, that the space-intuition cannot be changed in its essential laws and nature.

In affirming that the dimensions of space are necessarily three, and only three, it is important to premise that the planes of reference are perpendicular each to the other two. Without this assumption, the dimensions of space may be as many as we please. But, with this assumption, the claim is that the position of any point in space can be defined by straight lines drawn to each of these planes of reference. These straight lines are called the co-ordinates of the point, and they tell us how far the point is from each of the planes. The three planes represent the dimensions of space. Thus far nothing has appeared in the affirmative which is not purely hypothetical, or which does not confound the dimensions of things in space with the dimensions of space itself.

The first class of arguments consists entirely of illustrations drawn from analytic formulas. It is well known that the formulas of analytics are independent of geometrical representation. So far as the analytic reasoning goes, we are

free to choose n planes of reference, if we make no attempt at spatial representation. These formulas, however, admit of such representation when there are only three perpendicular planes of reference; and if n such planes were possible, then a formula involving n planes would also be representable. But this is far enough from proving that n planes are possible; it only deduces a consequence from an assumption.

But there is no need to have recourse to elaborate formulas to deduce this small conclusion. There is to the uninitiated a certain air of mystery in an involved and transcendental formula, and especially in a formula for a "pseudo-spherical" surface, which may serve to impose on the illogical mind, but the argument from such a formula is in nothing better than the following: In algebra, a can be represented by a line in space, a^2 by a plane surface, and a^3 by a cube; a^4 and all higher powers are unrepresentable. So far as algebra is concerned, it is a mere coincidence that a, a^2, and a^3 are spatially representable, and the algebraic analysis goes on in complete independence of space. It deals with numbers and their relations, and these are logical, and not spatial. But it would be quite easy to say that, if space had n dimensions, then a^n could be spatially represented as well as a or a^2 or a^3, and the argument would be just as forcible as the mass of what is uttered on this subject. In fact, mathematicians have fallen a prey to their own terminology in this matter. Through desiring to give the utmost generality to their analytic formulas, they have constructed them without any regard to actual space. Then they have discovered that, to make them representable, certain limitations must be made. Thus actual space is made to appear as a special case; and this is called flat space, Euclidian space, etc. But, by applying an adjective to space, they have suggested to themselves the possibility of

other spaces, and forthwith any given set of analytic assumptions passes for a space of the nth order. By this time the illusion is complete, and the request for a proof that those spaces of the nth order represent anything but analytic assumptions is resented as unkind.

The other class of arguments confounds the dimensions of things in space with the dimensions of space itself. If we omit reference to the three perpendicular planes of reference, a thing may have any number of dimensions. The various utterances concerning a curvature of space are all instances of this confusion. What is meant by a curvature of space itself is something which defies all comprehension, as much so as a curvature of number. It is assumed that, in case of such curvature, straight lines would at last return into themselves; but the simple fact would be, not that space is curved, but that the line is not straight, but curved. This would be quite intelligible, while the doctrine of a curved space is quite unintelligible. If it be said that straight lines never occur in reality, we have no objection, provided the claim be proved; but this is different from affirming that truly straight lines are not straight, but curved. The geometer does not assume anything about the reality of lines, but contents himself with showing what would be true of such lines, if they did exist. To determine the content and implications of our space-intuitions is his only aim; and, knowing that these intuitions are purely mental products, he is entirely free from doubts whether, in some outlying regions of space, these principles may not be invalid. Space being in the mind, and space-figures being mental constructions, they will always have the meaning which the mind assigns to them, and hence can never be twisted out of their proper significance.

This principle of a curvature of space has been invoked to save the universe from finally running down. If space be

curved, then the outgoing energy will at last be restored, and the system may keep agoing. But there is no need of the unintelligible assumption of a curvature of space to express this result. We can simply say that, if the nature of reality be such that radiant energy moves in curved lines, then it will at last come back to the point of departure. Of course, to make this assumption of any use, we should have to make many others, but, such as it is, it is an attack, not on our space-intuition, but on the first law of motion. In short, all the illustrations of a space of n dimensions can be brought into entire harmony with our space-intuition by substituting for a curvature of space a curvature in space, and for n dimensions of space n dimensions of things in space. This part of the doctrine seems to be largely due to the pestilent practice of viewing straight lines as segments of circles with an infinite radius. This custom, together with the allied one of viewing parallel lines as meeting at an infinite distance, has its practical advantage, but when it results in confounding all definitions and in uttering complete nonsense, it is high time to inquire whether the advantage be not too dearly purchased.

A poor argument, however, though a suspicious circumstance, is not a disproof of the thing to be proved. The doctrine of n dimensions can be tested only by a direct attempt to realize its assumptions. Where, then, is the nth dimension to be found? One writer, in his explanation of the disappearance of material bodies in spiritistic performances, assumes a fourth dimension of space, into which the bodies are drawn by the spirits. If there were beings who could observe only two dimensions of space, then a body which moved in the third dimension would disappear from their vision. If, now, there be a fourth dimension, then the spirits have only to draw the body into the fourth dimension to render it invisible. It would seem, then, that the

fourth dimension interpenetrates the three dimensions. The solid body which disappeared was not out of the room, but out of its three dimensions. And yet there was no point in the room which could not be defined in a space of three dimensions. The fourth dimension, therefore, is not something added to the three dimensions, but is something coincident with them; that is, it is not a *space*-dimension at all, but, if anything, it would be a state of matter in which it would not appear in any way. The necessity of putting the fourth dimension within the three dimensions deprives it of all right to be called a dimension of space. Upon the whole, it is not likely that the performances of sleight-of-hand tricksters will contribute much to philosophic discovery.

The relation of the doctrine to geometry is not clearly settled in the minds of its holders Some would view it simply as an extension of our present geometry, while others would view it as an attack upon it. If we conceive of beings dwelling in a plane and limited to conceptions of lines in a plane, it is possible that such beings should form a valid plane geometry; and if afterwards they should advance to a conception of the third dimension of space, their early geometry would be extended merely, and would be as valid as ever. Now, in the same way, it may be claimed that a new dimension of space would only extend our present geometry without in any way discrediting it. In that case the doctrine could be tested only by inquiring whether the notion of a new dimension represents anything more than a gratuitous assumption which defies all construction and comprehension. But many holders of the view regard it as conflicting with received geometry, and this position makes it possible to test the view by reflecting upon the character of geometrical truth. If that truth be strictly true, then any doctrine which conflicts with it is false. The believer in n dimensions will have to disprove

geometry before he can maintain his theory. If he insist that straight lines return into themselves, that only shows that he means by straight lines what others mean by curves. If he claim that parallel lines may meet, it only shows that he means by parallel lines what others mean by converging lines. Nor must he be allowed to make irrelevant appeals to the nature of things, for geometry does not concern itself with the nature of things, but with the nature and implications of our space-intuition.

A final word must be said concerning the unity of our space-intuition. It is often assumed that there may be beings which see things in only one or two dimensions, and they would, of course, be as positive about the impossibility of a third dimension as we are about a fourth. We know, however, that they would be mistaken, and what better right have we to insist on our view. If the fourth dimension be assumed to contradict what we know of the three dimensions, we should have the best right for rejecting it; and even if it were assumed only to extend our view, we should have a right based on the unity of our space-intuition. For these beings who see things only in one or two dimensions are pure myths, and their possibility is far from apparent. To begin with, the assumption that reality admits of any number of space-intuitions falls back into the popular form of Kantianism, according to which reality itself is quite indifferent to the forms of thought. But this is to divorce thought and reality entirely, and to leave the thought without any ground or explanation. But if reality is to explain thought, then a given phase of reality admits only of a given representation in thought. This notion that thought can shift about and view reality in any and every way betrays a total lack of appreciation of causation; it is the superstition of a time which had no conception of law whatever.

Further, our intuition of space is not built up by adding

one dimension after another; but the first and second dimensions are reached by abstracting from the unitary intuition of a space of three dimensions. Given this intuition, it is easy to attend to one dimension to the exclusion of the other two; but they could not be directly reached for the following reasons: Suppose a being with an intuition of only one dimension of space. At first we are tempted to think of that one-dimension as a line; but this it could not be, because to see it as a line, the being must be outside of the line, and the line must be across the direction of vision. But this would imply two dimensions of space—the direction of the line of vision and that of the line perceived. If we confine him strictly to one dimension, the line must take the direction of the line of vision, and this would become a point. But this point again could never be known as such, except in relation to other points outside of the line, and as this is contrary to the hypothesis, it could never be known as a point at all. The line itself is without breadth or thickness, and the being, if it knew itself as related to the line, must know itself as in the line; and all its other objects must be in the line, and hence all alike must be known as without breadth or thickness. For us who have the full space-intuition, it is easy to abstract from two dimensions and consider only the line, but for the being who has only the one dimension the space-intuition would be impossible.

The same is true for the two dimensions. In this case the being would be in a plane, but without any thickness. He cannot rise above the plane to look at it, for this would be to invoke the third dimension. He must stay then in the surface, and must find all his objects in that surface. But there can be no doubt that we are led to the conception of a surface only by our experience with solids; we reach it by abstraction of the third dimension. If there were no third dimension, we should certainly never have to come to

the notion of either line or surface. This being, however, who is in the surface, and who knows nothing of any points outside of the surface, would never know the surface at all. The surface is conceivable only as a limit between different parts of space, and, as these are impossible, the limit between them is also impossible. We view our space-intuition as properly a unit, and not as compounded of separate factors, and these factors which we separate in thought are abstractions, which are possible only through the unity of space as a form of three dimensions. All our dealing with the first and second dimensions of space implies the three dimensions. For the present, those who affirm that space may have n dimensions must be judged either to be calling a series of analytic assumptions by the misleading name of space or else simply to be making a noise.

CHAPTER II

TIME

According to the popular view, the world is in space and has its history in time. We have found ourselves compelled to deny that the world is in space, for spatiality is only phenomenal. We have next to inquire whether the world's history in time is an ontological or only a phenomenal fact. Kant made the same argument do for both space and time; but there are many difficulties in the case of time which do not exist in that of space, and which compel a separate discussion. The subjectivity of time is by no means involved in that of space. At the same time much that was said in the previous chapter will apply here.

As in the case of space, we distinguish between the ontological and the psychological question. We do not ask how we come to the notion of time, but what it stands for after we get it. Is it an existence, or a mode of existence, or only a mode of our thinking?

Kant set the example of calling space and time forms of intuition, and this has led to a very general assumption among philosophers that we have a proper intuition of time, such as we have of space. It is, therefore, a matter of great surprise, on looking around for this intuition, to find it wanting. We grasp coexistences in a single space-image which is *sui generis;* and when we think the things away, we are still able to outline the space as such. With time this is impossible. We cannot comprehend events in a single

temporal image, and when the events are thought away there is nothing remaining, even in imagination, which has a temporal character. As has often been pointed out, all our representations of time are images borrowed from space, and all alike contain contradictions of the time-idea. We think of it as an endless straight line, but the conception fails to fit; for the points of such a line coexist, while of the time-line only the present point exists. We think of it also as a flowing point which describes a straight line, but here also we implicitly assume a space through which the point moves; and without this assumption the illustration loses all meaning. Or if we wish to form a conception of earlier and later, we do it by positing a line over which we are to move in thought; and we measure the time by the motion and its direction. The temporal before-and-after is represented only by the spatial before-and-after. Nor are we content to borrow figures from the one dimension of space; in dealing with the system we generally have two dimensions, and sometimes three. Since space is filled with coexistences, all of which are alike in the same time, the time-line is extended to all these. Thus the line becomes a cylinder and the point becomes a plane; while the time passed over by the moving plane remains behind as a kind of third dimension. But in all these cases we have only space-images, which are applied to time only by metaphor. We cannot, then, properly call time a form of intuition, as we have properly no special presentation corresponding to it. In itself it is rather a certain unpicturable order of events. Whenever we attempt to picture it we replace temporal sequence by spatial sequence.

What, then, is time? The popular view of time closely resembles that of space. Time is conceived as an existence *sui generis*, which exists apart from things, losing nothing by their absence and gaining nothing by their presence. It

is independent, and hence without any essential relation to being, but moves on in ceaseless and steady flow forever. Like space, it is one of the necessities which being can neither create nor annihilate, and to which it must submit.

This view seems self-evident in its clearness at first glance, and it would not be surprising if some speculator should order up an intuition in support of it. But, in spite of the intuition and the apparent self-evidence, the clearness of this view turns out, upon inquiry, to be delusive. It is untenable on two accounts: (1) By making time independent of being it sins against the law of reason, which forbids all plurality of independent principles. This fact, which we have sufficiently illustrated in previous chapters, is conclusive against the independence of time. Whatever time may be, it is no independent reality apart from being. (2) The view which regards time as a real existence is hopelessly unclear and inconsistent in its assumptions and implications. Many qualities and functions are attributed to time in spontaneous thinking, which have only to be pointed out to be rejected, because they are inconsistent with the time-idea. This fact we proceed now to illustrate.

But before beginning it seems necessary to refer again to the ever-recurring distinction between the phenomenal and the ontological fact. Time as the form of experience or as the form of change is a perfectly clear and self-sufficing notion. In this sense our experience is in time, and there can be no question of having a timeless experience, or of describing experience apart from temporal relations. The question concerns that abstract and independent time which is more than the form of experience, which is rather a something in which events occur; and the claim is that this time is a fiction arising from separating the form of experience from experience itself. When we are dealing with time as the form of experience all is perfectly clear, and every one under-

stands what is meant. An engagement to meet at a certain time and place has no mystery for the understanding of any one; but when we abstract from the particular concrete things and relations, and attempt to conceive time by itself, then once more we are "lost and embrangled in inextricable difficulties," and are "miserably bantered" and buffeted by the absurdities which emerge.

In illustration of the unclearness of popular thought on this subject, it is not plain whether time be regarded as standing or flowing. Sometimes it is said to comprehend in its unity past, present, and future alike; and in its totality it is identical with eternity. There is but one time, as there is but one space; and all particular times are but parts of the one time. Sometimes it is said to flow, and sometimes it is mentioned as the standing condition of all flow. In one view time itself flows, and events flow with it; and in another view time stands, and events flow in it as a space or through it as a channel, or move across it as a background. All of these conceptions appear in the popular thought of time, and all are attended with great difficulties. If we regard time as a whole as existing, and thus embracing past, present, and future, then time as a whole stands, and the flow is put in things and not in time. In that case the distinction between past and future would not be in time itself, but in things, and especially in the observer's stand-point. The past would not be the non-existing, but that which has been experienced. The future also would not be the non-existing, but simply that which we have not yet experienced. There would be nothing in this view to forbid the thought that things might coexist at different points of the temporal sequence. There would also be nothing in it to forbid the conception of a being which should fill out the totality of time, as the omnipresent fills out space, and for whose thought the past and the

future should alike coexist. Thus quite unexpectedly we come down to the notion of the eternal now. But this is just the opposite of what the popular view means to say. Common-sense insists that time itself flows as well as the events within it. In truth, this notion of an empty time, with things flowing through it, is simply the image of empty space which has been mistaken for that of time.

But, on the other hand, if we do not regard time as existing as a whole, then we are shut up to the affirmation that only the present exists. This view also is held by spontaneous thought; and upon occasion it is stoutly affirmed that all existence is contained in the narrow plane of the present. But the present has no duration, and is not time at all. It is but the plane which, without thickness, divides past and future. Time, then, is not made up of past, present, and future, but of past and future only; and, as these do not exist, time itself cannot exist. It avails nothing against this conclusion to call the present the passage of the future into the past; for this passage must require time, or it must not. If it require time, then it is itself susceptible of division into past and future. If it be timeless, then time once more falls into past and future, and has no existence whatever. Besides, it is not easy to see how we can speak of the passage of the future into the past when both alike are non-existent. Such a passage can be represented only by a reality moving across a certain line, but which is equally real on both sides of the line; and this notion is inapplicable to time. When the moving reality is real only on the line, it cannot cross it.

It is equally hard to see how, on this view, time can have any duration. The past was once present, so that past time is made up of moments which once were present. But if the present have no duration, no sum of present moments can have any duration. Nor does it relieve the matter to

say that time, like space, is continuous, and that units of both are but arbitrary sections of the indivisible. Space can, indeed, be divided by a plane into right and left, so that the space to the right and that to the left shall make up all space; but this does not represent the relation of past and future, for the two divisions exist as real in the case of space, while in time they are non-existent. If the space occupied by the plane were alone real, then space also could not exist, for the plane is only a limit, and occupies no space. And if the plane should move under such circumstances, it would not pass over any space or generate any volume, for each integral of volume would perish as fast as born. The plane would continue to be all, and space would be nothing. This is the case with time. The plane is all, and duration is never reached. When we attempt to conceive duration, we must have recourse to space-illustrations, which are implicit contradictions of the time-idea. Time cannot exist, and things cannot exist in time. But if, to escape these difficulties, we allow that the present is a moment with proper duration, it is plain that this moment must lie partly in the past and partly in the future, or else that duration is not indefinitely divisible. Either assumption would swamp us by bringing the time-idea into contradiction with itself.

If we say that time as a whole stands we deny the time-idea. Past, present, and future coexist; and there is no assignable reason for the change from the future to the past. It is equally impossible to find in a standing time any ground for change. But we fare no better with the notion of a flowing time. If we say that time flows we must ask whence and whither. From the future to the past, or from the past to the future? But both past and future are dimensions of time; and it seems absurd to speak of time as flowing into or out of itself. Such a view is as impossible

as the thought of a moving space. A space which should start sideways, so as to leave spacelessness on one side and penetrate or telescope itself on the other, would not be a more absurd notion than this of a moving time. And, finally, when we say that time as a whole flows we need another time for it to flow in. Otherwise, the flow of time is timeless; and there is no good reason why the flow of things may not be timeless also.

Perhaps we may say that the moments of time flow, and not time as a whole; but then we have a puzzle in deciding what the relation may be between the standing time and its flowing moments. A time which is not the sum, or integral, of its moments is a difficult conception, and, allowing it, we see no reason in the standing time for the flowing moments. We should also need to know the whence and whither of the flowing moments and in what their flow in pure time would be distinguishable from their non-flow. We should have a movement in which there is neither moved nor mover, a movement without whence or whither, a movement which stops as soon as we attempt to conceive it as moving, and a rest which moves as soon as we attempt to conceive it as resting. The notion of a standing time contradicts the time-idea; and the notion of a flowing time results in a mental vacuum. Both views involve not merely mystery, but inconsistency and contradiction. Their exceeding clearness and self-evidence are due to the space-metaphors in which the doctrines are expressed; and these metaphors, upon examination, turn out to be inconsistent and inapplicable.

Plainly we are "embrangled" and most "miserably bantered" in our attempt to conceive time as independently existing; but the embranglement and bantering become still worse when we seek to determine the relation of this independent time to the things and events said to be in it. To begin with, it is impossible to see how anything articu-

late can exist at all in a real time. Things cannot exist in the past, or in the future; but in such a time the present is nothing; and hence they cannot exist at all. In discussing causality we found that no metaphysical predication whatever is possible until we bring the entire metaphysical movement within the range of thought, and view it as constituted by thought. Existence in time is a vanishing and perishing shadow which eludes all apprehension and all significance. Rightly enough, then, did Berkeley say of this abstract time, that it led him "to harbour odd thoughts" of his own existence; and he might have added, of all other existence as well.

Again, what is the relation of the independent time to events? The movement of time is not supposed to be the movement of events, and the movement of events, though in time, is not supposed to be due to the movement of time, but to the causes at work. In what relation are these two orders of movement? If one might go faster than the other, then our time, which is taken entirely from the order of events, would be no measure of that absolute time back of events. To explain the connection, a number of vague fancies, borrowed from space, arise in the mind, as that the stream of time floats events along with it; and these notions often impose upon us their imaginary solutions. But the more we reflect upon the matter the more difficulty we have in finding any connection between time and the events said to be in it.

But here it may occur to us that the relation between time and events is that the former conditions the latter; and this will certainly seem to many minds a sufficient and final answer. But one must confess inability to get any notion of what this conditioning may be, unless it is of a dynamic character, and such a conditioning cannot be reconciled with the notion of time. That time is causal and does

anything is as great a scandal to common-sense as could well be conceived; and when the notion of doing something is left out, one is quite at a loss to know what the conditioning is. But here it will certainly be asked if we are not aware of the distinction between a cause and a condition; and we reply that the distinction is a familiar one, but that it helps us here is the point which seems doubtful. That a thing should be conditioned by its own nature, or law, is a conception which involves no causal determination; but that a thing should be conditioned or in any way determined by another thing without dynamic influence seems to be an utterly vacuous conception. Hence if we deny to this real time all influence upon events, no one can tell what he means by events being in that time; and if we attribute an influence to time we contradict the notion of time and shut ourselves up to an endless regress, unless we suppose that time can act timelessly, or without time to act in.

And now, to complete the confusion, we point out that if time be real and without causal influence, the whole series of events runs off instantaneously; for on this view the conditions of change are not to be found in time, but in the interactions of things; and when the dynamic conditions of change are fulfilled there is no reason why the change should delay. If we suppose that time does something which was lacking, or breaks down some hinderance to the change, or exercises some repressive action, we make time a thing with active powers; and this view is contrary to the supposition. But if we do not do this there is no escape from admitting that the fulfilment of the conditions and the entrance of the change are absolutely coexistent. For empty time can do nothing; and one cannot see why, in such a case, a greater flow of time, provided the phrase in general meant anything, should be more effective than a lesser flow. Certainly n minutes could do no more than

any fraction of a minute; and infinite time would furnish nothing not contained in infinitesimal time. The integral of emptiness is always emptiness, and no addition of zeros can produce a sum. We must, then, regard the event as coincident with the fulfilment of its conditions. Hence the beginning and the end must coincide in time. Every effect is given simultaneously with its conditions, and each effect in turn becomes the cause of new effects, and these are likewise simultaneously given; and thus the whole series exists in a point of time without any real before and after in it.

If, then, we conceive inactive time as either resting or flowing, it is quite impossible to assign any articulate relation in which it can stand to things or events. It neither acts nor is acted upon, but remains a mere ghost outside of being, contributing nothing and determining nothing. It does not even measure anything, for our units of time are not taken from time, but from some change in things—a revolution of the earth, the swing of a pendulum, etc. If, on the other hand, we conceive time as active we contradict the time-idea.

Finally, the believer in a real time will affirm with great positiveness that our mental life itself bears witness to the reality of time. However we may confuse ourselves about the world-process, we know that we have lived through a real past, and that we are now able to compare it with a real present. Any attempt to deny time, it is said, must shatter on this fact. But this objection largely depends on overlooking the distinction between the phenomenal and the ontological. No one can think of denying the relations of time in experience. But these relations are established by the mind itself, and if there were not something non-temporal in the mind they could not exist for us at all. The succession in consciousness to which the realist appeals so confi-

dently is the very thing the knowledge of which makes his realistic view impossible. If there were nothing unchanging and timeless in the mind, the knowledge of succession could never arise. The mind must gather up its experiences in a single timeless act in order to become aware of succession. The conceptions which are arranged in a temporal order must coexist in the timeless act which grasps and arranges them. The conception of sequence not only does not involve a sequence of conceptions, but it would be impossible if it did. The perception of time, then, is as timeless as the perception of space is spaceless. The things which are perceived in time must yet coexist in timeless thought in order to be so perceived. The admission of ontological temporal differences in thought would make thought impossible. It only remains that time be restricted to phenomenal existence, and that thought instead of being in time be regarded as the source and founder of temporal relations, which are the only time there is. And the supposed ontological time is merely a shadow of experience, and its necessity is merely a consequence of the temporal law as a rule of mental procedure.

Thus the notion of time as a separate ontological existence shows itself on every hand as a congeries of contradictions, and must be given up. The impossibility of more than one independent principle forbids us to admit the independent existence of time. Whatever it may be, it depends on being as a consequence or creation. But the attempt to think of time as a substantive fact breaks down from its inherent unclearness and contradiction. This view of time, when analyzed, is always found to deny itself. Conceived as resting or flowing, time is absurd. Conceived as ontological, it cannot be brought into any relations to things without positing an interaction between them; and then we need a new time as the condition of

this interaction, and this would lead to an endless regress. Time, then, cannot be viewed as a substantive fact created or uncreated. As a whole, time does not exist, and substantive reality is not in time any more than it is in space.

This result we may hold with clear conviction, but it would be very easy to misinterpret it. We are by no means out of the woods yet. Reality certainly is not in time as something independent; but for all that yet appears time might be in reality as a law of existence. If there were a being which had its existence in succession, such being would not be in time, but its existence would be temporal. Moreover, when we say that reality is not in time, reality is a word of uncertain meaning. It might mean all reality, finite and infinite alike; or it might mean finite reality; or, finally, it might mean the objective cosmic order. In the last case we run a very serious risk of confounding the apparent order, which is temporal, with an assumed noumenal order which is very possibly fictitious. We shall need, then, to look well to our goings, or we shall fall a prey to some verbal illusion.

The common conclusion from these facts is that time, like space, is only the subjective aspect of things and processes which are essentially non-temporal. In this putting there is an implicit reference to the Kantian noumena which lie as realities beyond the "subjective aspect"; and this aspect is supposed to belong to us, constituting a veil rather than a revelation of existence. For the present we will not insist on the doubtful character of these noumena, but simply consider the attempts to make the subjectivity of time acceptable. This will finally lead us to a better understanding of the form which the doctrine must assume in order to be tenable. The traditional idealistic view is almost as obnoxious to criticism as the traditional realistic view.

Since the time of Kant the ideality of time has been held as being as well established as the ideality of space; but in fact it is a much more difficult doctrine. We have a clear experience of the possibility of thinking and feeling apart from space. We do not regard our souls as spatial; and space-relations do not enter into our internal experience in any way. That there should be existence apart from space is not, therefore, so difficult a conception. With time the case is different. It enters into our entire mental life, and cannot by any means be escaped. Hence we cannot appeal to any non-temporal experiences to aid our thought; and nothing remains but to analyze the notion, and see if we cannot reach a stand-point from which the difficulties may, at least to some extent, disappear. The holders of the doctrine have taken it all too easy in this respect. They have contented themselves with arguments which show the ideality of space, and have not bestowed upon time the attention which the peculiar difficulties of the problem demand. We proceed to examine the attempts to make the subjectivity of time credible.

And first we mention a rhetorical device. Long and short, it is said, are relative terms, and our estimate of duration is purely subjective. The time which is long to one is short to another, according to the state of mind. With God a thousand years are as one day; and even to the old man a long life is as a tale that is told, or as a watch in the night. The whole of human history is nothing to the periods of geology; and these, again, shrink to insignificance when we ascend to the cycles of astronomy. What, then, it is said, are all finite periods to Him who inhabits eternity? Remarks of this kind have a certain value in arousing the feeling of wonder; but they are valueless in philosopical speculation. No doubt our estimate of the length of time is purely relative and subjective; indeed, if the world-proc-

ess did not exist as a common time-keeper, every man would have his own time. Time is one only because we measure it by reference to the same objective process, or to the same consciousness. But the before-and-after of things is not a matter of feeling. Relatively, the whole measure of finite existence may shrink to a span, but the time-order remains unchanged. Something more powerful, therefore, must be found, if we are to succeed in reducing time to a purely subjective existence.

If reality were a changeless system of things in changeless relations, like the members of a thought-system, or like the ideas of Plato's philosophy, it would be easy to view the sequence of things in our experience as only a sequence of knowledge, and as due entirely to our finiteness. Thus, mathematical truths coexist; but we grasp them successively, not because they really succeed in time, but because our finite minds are unable to grasp them all at once. Hence we are often tempted to think that the earlier propositions in geometry precede and found the later. But a moment's reflection convinces us that the only relation in this case is that of logical sequence, and that the apparent temporal sequence is merely the reflection of our own finiteness, which compels us to grasp successively what exists simultaneously. A perfect insight into truth would grasp it in one changeless intuition, and the illusion would not exist. If now the world were such a system of logical relations, it would be entirely credible that time is not only subjective, but exists only for the finite, being in every case but a reflex of limited power. It might be said that even in this case we could not dispute the reality of time, for time is given not merely in the movement of the outer world, but also and pre-eminently in the movement of thought. But this objection would be invalid, for this psychologic time would be nothing but a subjective fact, and would have no

significance for the changeless reality, or for the omniscient mind which should grasp it in its changeless intuition. Time would be simply a movement in the finite mind, while for the infinite there would be an eternal now.

Unfortunately, this illustration is not entirely applicable to the case in hand, at least unless we adopt the Eleatic notion of being. For the Eleatics there is no need of time. Action and change do not exist, and things are but the eternal consequences of being, just as all mathematics is eternally existent in the basal axioms and intuitions. In such a scheme time cannot be anything but an unaccountable illusion in finite thought. But we are already committed to the Heraclitic view of being so far as change is concerned. For us, things are not resting in changeless logical relations, but are active and changing; and hence it is impossible to reach the ideality of time by eliminating change from being. We must have motion in things as well as in the observer. But, on the other hand, the notion of time seems the great dividing-wall between Heraclitus and the Eleatics. When we exclude time, cause and effect must coexist; and then the effect is not produced by the cause, but is only its logical implication. Without a real before-and-after it seems impossible to prevent the dynamic relations of reality from vanishing into purely logical relations; and this would be to abandon Heraclitus and return to Spinoza and the Eleatics. The alternative can be escaped only by showing that change does not imply time as an actual existence, but that time is only the subjective appearance of change. If this can be made out, there will be no difficulty in accepting the ideal theory.

But before passing to this question we must consider an objection springing out of the illustration from a changeless system. It may be said that we confound time with duration. Time itself may be viewed as a correlate of change;

but if there were no change the changeless would still endure. If, then, we should adopt the Eleatic conception of changeless being, so that all the consequences of being should changelessly coexist with it, being as a whole would still have duration. There would be no sequence, but there would be duration. This distinction between time and duration, though it has often appeared, especially in theology, we cannot view as tenable. For duration can only mean continuous existence through time, and without the notion of time duration loses all significance. The only reason for distinguishing separate times in the changeless would be the sequence of mental states in ourselves; and this sequence itself is change, and hence contrary to the hypothesis. We can give duration significance, as applied to the changeless, only on the assumption of an independent flowing time, which moves on ceaselessly and carries being with it. But this view we have found empty and impossible, and hence we do not allow that duration has any application to changeless existence. Such being simply is, and the distinction of past and future does not exist. Even the "is" we view as an affirmation of being, and not as a present tense. The difficulty in accepting this view is due partly to an implicit return to the notion of an independent time, and partly to the fact that even in such a fixed state we assume ourselves as present with all our mental changes.

Time, then, depends on change. In a changeless world time would have no meaning. But the actual world is not changeless, and thus the question arises concerning the relation of change to time. That it cannot be in time, as something independent of itself, we have already seen. In that case the whole temporal series would exist at once without any temporal sequence, and thus the assumed reality of time would give us a curious form of the ideality of time, in that it would find the succession of things entirely in our

minds and not in things themselves. But while change is not in time, its factors are successive, and thus change has the temporal form. Its members cannot be brought together in temporal coexistence, and the attempt to do so involves a tacit affirmation of the time which is denied. Time, then, cannot relate to any independent flow outside of things, but it does relate to these phases of change. These cannot be related as coexistences, but only as sequences; and time expresses these relations. The date of an occurrence is not a moment of absolute time, but expresses a relation within the changing series. How shall we conceive this relation?

The problem now takes on the following form. As long as we apply the law of the sufficient reason on the impersonal plane, change in appearance is impossible without change in reality. There is then an order of real change, and the idealist has to show that time is but the subjective aspect of that order, or the form under which we conceive change.

The idealist now has the floor and offers the following exposition. As the dynamic relations of things are spaceless, yet demand that things should appear in space, so the dynamic relations of things are timeless, but demand that they shall appear under the form of time. The notion may be presented as follows: We have before pointed out that change does not occur in an independent time, and that in the series A, A_1, A_2, . . . A_n, by which we represent the world-process, only dynamic relations are concerned. We have simply a relation of cause and effect without any admixture of time-elements; and the notion of time can only be the translation of this causal connection into terms of sequence. If, now, we suppose some perceptive being in the midst of this process, say at A_m, who could discern the order

of dependence among the members of the series, he would perceive that each member is conditioned by the preceding one, and conditions the succeeding one. A_m is conditioned by A_{m-1}, and conditions A_{m+1}. The attempt to represent this relation in thought results in their arrangement in a temporal scheme, in which the cause is made the antecedent and the effect the consequent. Antecedence and sequence is the universal form under which the mind represents to itself causation; but, when we reflect upon the matter, we find that time does not enter into the reality, but only into the appearance. To return, now, to our being at A_m, his own position will constitute for him the present. He will perceive, too, that A_m conditions all the higher members of the series, and hence he will locate them in the future, and he will make them far or near, according to the complexity of their conditionedness. A_{m+1} will be conditioned only by A_m, while A_{m+2} will be conditioned by both A_m and A_{m+1}; hence it will be put further on in the series. This being will further perceive that all the lower members of the series condition A_m, or his present, and hence he will put them in the past and at greater or less distances, according to their relations to A_m. If, in the series, this being should discover an unconditioned member, the regress would stop at that point, and that member would appear as eternal. Thus a tendency to represent dependence by temporal antecedence and sequence would produce in such a being the perception of a temporal order, even in a perfectly timeless system. That there is such a tendency in the human mind cannot be denied, for it is so strong that we are always tempted to resolve logical and dynamic sequence into temporal sequence. But we have seen that the dynamic sequence bears no marks of time, and hence we must conclude that the temporal order of things exists only in thought, and is purely a product of the observing mind.

There may be some truth in this view, but it does not seem to be well put; or rather the exposition is not without ambiguity. The result is to show how, in a timeless system of conditioning and conditioned members, the appearance of time might arise as the way in which we represent dependence. But we set out to discover the relation of time to change, and that is not clearly the same matter. There is one fact in our temporal experience which is fatal to the attempt to make dependence take the place of change. It is, indeed, conceivable that in a changeless system the relation of dependence should be represented as that of before-and-after; so that for every being at different points in the system, all the lower members should seem to be in the past, and all the higher members should seem to be in the future. But in such a case every being would have a fixed present. The being at A_m would always have his present at A_m, and past and future would be fixed quantities in experience. But this is not the case. A_m does not remain the present, but forthwith gives place to A_{m+1}; and this in turn is displaced by A_{m+2}. Thus the future is ever becoming present and vanishing into the past. But this fact is impossible so long as there is no change in reality. Hence change can never be made phenomenal only, but is a fact of reality itself.

We are certainly not getting on very fast, but we are making some progress, though it may not be apparent. The net result thus far is about as follows: There is no independent time in which change occurs and by which change is measured; but change is nevertheless real, and time as the form of change is also real. Time dates and measures do not refer to an independent time, but they express real facts and relations within the changing series. The series A, A_1, A_2, A_3, . . . A_n is not in time; and between A and A_n there is no time. Neither is A earlier than A_n in any

absolute time, for that which makes a thing earlier or later is its position in the series. But A and A_n, though not separate in any absolute time, are nevertheless not coexistent, for their relations are such that the existence of either excludes that of the other. The objective fact is being passing from state to state, and these states are mutually exclusive. Change does not, indeed, require time; but it results in a new state which excludes, and hence succeeds, its predecessor. This fact of change is basal. It is not in time, and it does not require time; but it founds time; and time is but the form of change. In the common thought time exists as a precondition of change; in our view change is first, and time is but its form. It has no other reality.

The view thus reached is a compromise between the ideal and the current view. Absolute time, or time as an independent reality, is purely a product of our thinking. In this sense, then, the world is not in time. But change is real, and change cannot be conceived without succession. In this sense, the world-process is in time. But distinctions of time do not depend on any flow of absolute time, but on the flow of reality, and on the position of things in this flow. To say that there is time between distant members of the series, means only that reality changes in passing from one state to another; and the amount of time is not simply measured by the amount of change, but is nothing but the amount of change. The rate of change is the rate of time; and the cessation of change would be the cessation of time.

This, we have said, is about the net result of the previous discussion; but that we have not yet reached any final resting-place appears on a little reflection. Thought itself disappears, if we do not allow some sort of changelessness or timelessness across all change or temporality. The

changing world must in some way be paced to the changeless, or thought collapses. In treating of change and identity we found that the two can never be reconciled on the impersonal plane. The Eleatic was able to refute the Heraclitic; and the Heraclitic was equally able to refute the Eleatic. Meanwhile thought was seen to demand both elements, but the discovery was also made that their union could be effected only as we abandoned the abstract categories of the impersonal understanding, and rose to the conception of active intelligence as furnishing the only possible concrete union of the categories in question, and as being indeed the only true reality and the place of all subordinate realities.

These results must be recalled here. The truth is that the common notion of an extra-mental reality of some sort, which we have already exorcised and cast out, has unwittingly come back into our thought and darkened the discussion. This reality, which is supposed to be changing apart from thought, we have sought to reduce to timelessness, and, as might have been expected, with very imperfect success. And we have tacitly assumed that this changing reality is something possible on its own account, and that its temporal relations can be determined within the changing series itself and without any reference to intelligence. In all this we have forgotten our earlier studies, and by consequence have erred and strayed from the way. But in fact change is nothing except with reference to an abiding intelligence. As an idea it eludes us until it is contrasted with the unchanging; and as a reality it is nothing until it is subordinated to active intelligence, which is the only causal reality and which can recognize nothing but itself and its own products. The attempt to find a present in the changing series apart from reference to intelligence is equally a failure. Considered as temporal and extra

mental, the series falls asunder into past and future, leaving the present only as the plane of division between them. With this result, the extra-mental time vanishes altogether. Hence the doctrine of time must be construed not with reference to an extra-mental existence, but from the stand-point of self-conscious intelligence. Only thus can we escape the intellectual scandals and contradictions and impossibilities which haunt both the traditional and the idealistic view of time, so long as any extra-mental existence is allowed.

Now from this point of view the question assumes a very different aspect. Time, as the form of our subjective experience, takes its origin from the stand-point of conscious intelligence, which constitutes its own present. This present is not in time as anything independent of itself; it is simply a relation in consciousness. The mind relates its actual experience to itself, and thus constitutes the only present there is. When we attempt to have experience in the present, considered as a point or section of a real time, we fall into contradiction. We escape this by the insight that the present can only mean the actual in experience; and past and future get all their meaning by being related to this actual. Experience, then, is not in the present, but the present is in experience. If we would know what the present means we must not look for a point in abstract time by which to define it; we must rather look into experience itself for the meaning of the relation.

And this which is true for our subjective time is equally true for objective or cosmic time. This time also can be understood and defined only from the stand-point of conscious intelligence. Taken abstractly, or by itself, it makes both the world and thought impossible. And they remain impossible until it is seen that time is neither an ontological reality nor an ontological process, but rather and only a

thought-relation which has neither existence nor meaning apart from thought.

And thus we come again upon the fact, often referred to in previous chapters, that thought cannot be understood through its own categories. That is, the categories are nothing which precede intelligence and make it possible: they are rather the categories of intelligence, and for their concrete meaning we are referred, not to a formal analysis of abstract ideas, but to our experience of living intelligence. We have seen this to be the case with the categories of being, identity, unity, and causality; and now we find the same fact in the case of time. Thought is the source of temporal relations; and for their meaning we must fall back upon experience, rather than any reflection on the abstract temporal category.

Time, then, is not an ontological fact but is essentially a function of self-conscious intelligence. Shall we say, then, that intelligence itself is timeless; and, if we do say so, have we not fallen into absolute unintelligibility, if not into downright raving? Surely, considering the nature of our experience, the brevity and changefulness of our existence, it would seem that no one can be serious who denies our temporality. A little paradox is permissible; but it becomes an insufferable affront to good sense when it is carried to such shocking extremes.

This remonstrance has something in it; but for the most part it rests on overlooking the distinction between the phenomenal and the ontological reality. We have repeatedly declared that no one can deny time as a form of our experience, and, in this sense, as a fact of reality. But this time exists only in the experience of a self-conscious intelligence; and it is permitted to inquire whether it has existence or meaning apart from that relation. It never occurs to the idealist to have experiences without temporal relations

among their elements, but these exist only in and for thought.

There is a somewhat complicated thought underlying the remainder of the remonstrance. The purely temporal form and relation are complicated with the limitations of the finite; and thus two questions quite distinct are confused. There is also an implicit effort to conceive the non-temporal temporally, or to make temporal coexistence the antithesis of temporality. For the sake of untangling the matter, we must divide the questions, and consider the relation of time, first, to the finite intellect; secondly, to the finite spirit as existing; and, thirdly, to the infinite and absolute being.

And, first of all, the finite intelligence, in so far as it is intelligence, is timeless; that is, it has no real before-and-after in it, but it establishes temporal relations. If we say that such a being is unthinkable in abstraction from temporal relations, that can only mean that an abstract subject which did nothing, and hence did not manifest itself as mind, would be nothing for thought. But if we mean that this mind which establishes temporal and other relations, and thus produces an articulate thought-life, is itself comprised in those temporal relations, as something apart from and antecedent to thought, we must say that this view is truly unthinkable and leads to the destruction of thought. What is this being? It is the subject of the thought-life, and it knows and reveals itself in this life. If we ask how it can be a self-conscious subject and manifest itself in the establishment of the forms and relations of thought, the answer must be that there is no answer. Reality cannot be deduced; it is; and the only work of speculation must be to discover what the reality is which is. To recognize and describe, not to deduce or comprehend, must be our aim.

The pure temporal form does not involve the knowing subject, whether finite or infinite. When in a dream the mind gives the spatial form to its objects, the mind is the source of the form, but it is not included in it. Through our connection with an organism, however, we acquire a new relation to space. The organism exists in spatial relations, and thus we seem to have a location. This, as we have said in the previous chapter, is only an expression of our finitude, and is no essential part of the space intuition. The same fact appears in the case of time. The purely temporal form alone does not involve the subject. But we are also members of a system which is independent of us, and we are to a very great extent subordinated to that system. This relation manifests itself in a certain temporal character of our experience. The self is limited; it comes and goes, has beginnings and endings, and unpicturable pauses and variations which are imposed upon it from without. In this sense our life is temporal; and in this sense temporality is only the shadow of our finitude and limitation, and our subordination to the total system and order of finite existence. And this temporality is not in time; it is simply an aspect of our experience.

From this point of view time is seen to be largely relative in any case. Time is primarily the form of individual experience, and would remain relative to the individual were it not for the existence of the cosmic order which marks the cosmic time, and furnishes the common timepiece by which our individual times are regulated. But even this does not remove the relativity of time. We have seen that this process gives no time order until it is related to conscious intelligence; and the temporal judgment will vary with the powers of the one judging.

First of all, the present is relative. We have seen that we cannot have experience in the present, but we consti-

tute the present by the actual in experience. But the range of this experience varies with the range of our powers. One able to comprehend a large body of objects or events within the field of consciousness would have a more extensive present than another who could grasp but a few. If we could retain all the objects of experience in equal vividness and immediacy they would be alike present. A mind which could do this would have no past. Again, a mind in full possession of itself, so that it does not come to itself successively would have no future. Such a being would have a changeless knowledge and a changeless life. It would be without memory or expectation, so far as itself was concerned, yet it would also be in the absolute enjoyment of itself. For such a being the present alone would exist, and its now would be eternal.

The present, then, is no point in absolute time, but a relation in conscious experience; and its measure and contents depend on the range of our powers. Every intellect transcends time as mental form; but the finite mind remains under the law of time as limitation, by virtue of its finitude. When we speak of transcending time this double aspect of the question must be borne in mind. The complete transcendence of time in both senses is possible only to the absolute person. Here only do we find the absolute independence and changeless self-possession which are needed to constitute the timeless life. Finite minds, on the other hand, are in time in a sense. Change penetrates into their life. But this time is not something which contains them, or which precedes and conditions the change; and the changing life is only an expression of our subordination and finitude.

What we have said of the timelessness of the absolute being might possibly be allowed so far as its own self-knowledge and self-possession are concerned; but what of

the will whereby the cosmic process is realized and carried on? This process, we may say, is essentially changing and progressive, and hence essentially temporal. There is succession in the process, and there must be succession in the realizing will.

This seems perfectly clear at first sight, but grows cloudy on reflection. If the world-process is to be in time in any sense, it must be in time for some one. Its temporality has no meaning in itself. Without doubt the cosmic process has the temporal form for us; and very possibly it has the temporal form for the Creator. Temporally considered, it is successive. Temporally considered, it is impossible to reduce it to coexistence. But the temporal form as little requires temporal succession in the realizing activity as the spatial form requires spatial extension in the realizing activity. In both cases we come upon an unpicturable ground of the order, but we are not permitted to carry the factors of the phenomenal order into its ontological ground. Unless we are to lose ourselves in the infinite regress, all change must at last be referred to the changeless, the unchanging source of change. The change must be found in the effects, and not in the cause. When we come to the unconditioned cause, further regress becomes absurd. But such a changeless cause is a contradiction on the plane of impersonal necessity. Nothing will meet the case except the conception of the absolute person, which freely posits a changing world-order without being himself involved in the change.

If, however, we persist, and insist that even this absolute cause may still change himself and would change himself in the case mentioned, we find ourselves unable to make out our own meaning. From what to what would the change be? There is no developing life within the infinite by which to measure it. If we say it is at least from inactivity

to activity, or from one phase of activity to another phase of activity, we can make nothing of this except by referring to the products. We would hardly feign a sub-conscious substance with divers modifications in it; and if we dismiss this fiction, then the only assignable change falls among the effects; that is, within the temporal order. We conclude, then, that the activity whereby the temporal order is realized has no temporality in itself. Such temporality as the world may have other than the thought order would exist not for the creator, but only for the finite spirits which are comprehended in the cosmic process.

And now it will doubtless occur to the dealer in abstractions that all this is hopelessly contradictory. The tracing of change to the changeless, and the deduction of change from the changeless, what is this but contradiction? That is indeed what it is on the plane of impersonal abstractions. Change and changelessness are contradictory ideas, and neither can be viewed as the source of the other; for no reflection on either will reveal the other except as its contradictory opposite. And thus we find ourselves in a great embarrassment. On the one hand, reflection shows that the admission of ontological change into intelligence would destroy it, and on the other, logic refuses to accept the changeless as the explanation of change. There is no way out of this deadlock on the impersonal plane. On this plane, by the law of the sufficient reason, we can only come to the Heraclitic flux and the destruction of thought. The solution of the puzzle is found in leaving the impersonal abstractions, and rising to the plane of free personality. Change does not arise from abstract changelessness, but the free mind initiates change without being itself involved in it. Thus the contradiction disappears. How this is possible is quite beyond us; but it is something to see that it is nevertheless actual, and that thought is hopelessly stalled

on any other view. And when, instead of taking change and changelessness abstractly and verbally manipulating them, we take them as they are given in the mind's living experience of itself, the problem solves itself. The solution by walking is the great practical solution; and the abstract thinker who wants something deeper only mistakes his fictitious abstractions for reality.

It is something of a relief to remember again that these difficult questions refer in no way to experience, but only to its ontological ground. And however sure we may be that the essential ground of experience is neither spatial nor temporal, but founds both spatial and temporal relations, we are under no obligation to tell how it is done, and we may go on making engagements to meet at times and places with as much certainty of our meaning and security as to the fulfilment as if the ideality of space and time had never been dreamed of. And thus after our long wanderings we come back in a way to the common view. Having got clear of all extra-mental realities, we have only to take account of mental realities. We are no longer haunted by those back-lying noumena which ought to be known, but which cannot be because of the masking mental form. We are allowed, then, to take the existence of things for intelligence as their true and only existence, and hence in knowing this existence, so far as things are concerned, we know all there is to know. And thus the mind is face to face with reality after all. Only we must remember that there are realities and realities. Phenomenal realities are not to be mistaken for ontological ones; and the categories of phenomena must not be applied to their ontological ground. Every one can see that the thought of length is not long; and it is just as clear on reflection that the thought of time is not temporal. Finally, our judgments of phenomenal time have in them so much of relativity, owing to the lim-

ited range of our consciousness and our general dependence and finitude, that we cannot be too circumspect in transferring them to the infinite.

For the sake of clearness we may sum up briefly what we conceive to be the outcome of the discussion:

1. Time is primarily an order of relations in our experience. This order admits of no question or denial.

2. There is no ontological time separate from things and events, in which they exist or occur.

3. There is no order of ontological change of which time is the form and to which time may be referred, without reference to intelligence.

4. Both time and change must be referred to intelligence, as their source.

5. Neither time nor change can be carried into intelligence as such without making thought impossible.

6. Neither time nor change can be construed with reference to any extra-mental fact, but only from the stand-point of self-conscious intelligence.

7. Hence the temporal judgment becomes relative to the range and contents of self-consciousness.

8. Non-temporality is not to be conceived as a temporal coexistence, as if one should say that the earth is on all sides of the sun at the same time, but rather as the immediate possession of the objects by the conscious mind. This relation cannot be construed in temporal terms, but must be experienced.

9. What this may mean may be gathered from reflection on what we call present experience. This is not temporal in the sense of having a real before and after in it. It is temporal in the sense of having the temporal form. It is non-temporal in the sense that the conscious self grasps all its elements in an indivisible act, and thus makes consciousness possible.

10. But still experience has the temporal form; and we may resume our temporal language with all confidence, only guarding ourselves against mistaking this form for an ontological fact, and also against overlooking the relativity in the temporal judgment due to our limitation.

CHAPTER III

MATTER, FORCE, AND MOTION

The phenomenality of space implies of course the phenomenality of all that appears in space or in spatial form. Matter, then, in the sense of the apparent bodies about us, together with their apparent movements, must be reckoned to the apparent rather than the real, the phenomenal rather than the ontological. This does not, indeed, imply their illusory or fictitious character, for they constitute the chief factor of objective and universal experience. As phenomena they are real in their way, and as phenomena they have their laws. A knowledge of their nature and laws is almost the sum of practical wisdom, and this knowledge can be acquired on an empirical basis. The only caveat involved in our doctrine lies against taking these material phenomena as substantial or ontological facts. With this understanding, physical and mechanical science has a most important field for practical investigation and one which it may cultivate without being molested or made afraid by metaphysics.

Matter

The current notions of matter, as we should expect, are a heterogeneous product of sense thinking and superficial reflection. The thought is mainly determined by sense experience and its spatial forms; and whatever other metaphys-

ical element is added is adjusted to them, and takes on something of their character. We shall find our advantage in a study of the popular notion.

For a person on the sense plane matter presents no problem whatever. Our senses reveal various bodies in space, and all we have to do is to read off the sense report. There is no mystery in the case, for everything is visibly there. But reflective thought, even in its crude stages, finds itself compelled to work over the sense appearance and modify our spontaneous conceptions. Accordingly, all theories of matter from hylozoism to atomism have in them a speculative element which transcends and modifies the sense report.

For spontaneous thought bodies in space are undeniably given. The divisibility of body is also given as a fact of experience. It is, however, impossible to divide something into nothing; and the thought of infinite division admits of no completion. We always have something left when we stop. On all these accounts thought naturally takes the direction of some form of the atomic theory. Again, as solidity seems to be undeniably given in experience as a property of matter, and as actual bodies admit of expansion and contraction, the corpuscular philosophy, with its two factors of the atoms and the void, naturally emerges. The little lumps supply the being, and the void space founds the possibility of form and motion. For a long time nothing more was thought necessary, unless possibly a prime mover were occasionally demanded. The atoms, moving and combining in the void, were the sole reality in matter, and the sufficient ground of material phenomena. When the demand for causation became more prominent, instead of finding it in a prime mover, it was finally resolved to carry it into the atoms themselves under the form of moving forces. These were supposed to inhere in the atoms and found their

changes. The true material realities are the atoms and their inherent forces, and all explanation results from their composition and interaction. Physical science is generally based on some form of this theory.

There is a certain formal completeness and superficial plausibility in this view. For one interpreting sense experience by spatial and mechanical categories, it is hard to see how any other view is possible. We cannot rest in visible bodies as final. The mere fact of divisibility alone would reduce them to compounds. But as we hold to real space and real extension, we may well rest in corpuscles, or little bodies, as final. These lie so far below the range of experience that we can easily ignore the logical difficulties in the notion; and we can use them without critical molestation. Thus we seem to secure a solid foundation of reality, and satisfy the category of being. And these little bodies are in space, and admit of various movements and combinations. With this outfit we may well explain visible body by their composition, the all-explaining category of the imagination. Finally, causation is provided for by the moving forces, and nothing more seems to be needed for successful and adequate speculation. Indeed, we may even doubt if anything more can be allowed. The void is the negation of being; and what is there in the void but the atoms? Certainly there is nothing in sight but bodies, and reflection on the established facts of experience teaches us that these are atomic compounds. Atoms we know, and the void we know, and what is there besides?

How naïve all this is is already familiar to us. Material phenomena are mistaken for ontological facts; and the attempt is made to interpret the causal reality in phenomenal forms. Space and space relations are supposed to be independent existences, and mechanical causation is assumed as a matter of course. But this transparent clearness vanishes

as soon as we recall the distinction between phenomenal and ontological reality, and between the formal necessity of a category and the concrete form in which it exists. Being there must be, no doubt, but it does not follow that it can be thought in the form of lumps. Causality there must be even for material phenomena, but for all that it may be impossible to conceive it under the form of moving forces inhering in solid corpuscles. This uncertainty of physical metaphysics deserves further illustration. Instead of dismissing the doctrine at once on the strength of our previous discussions, it seems better, and more likely to produce conviction, to show its essential confusion on its own plane, as soon as it transcends phenomena and their relations.

Scientists are agreed as to the necessity of the atomic theory as opposed to the spatial continuity of matter. If apparent matter be a true ontological existence, it has an atomic structure. There is, however, no agreement as to the correct conception of the theory; and in application it takes on different forms according to the character of the facts on which it is based. Physics and chemistry, mineralogy and biology, would lead to widely differing conceptions, and these would agree in little more than in affirming atomism. For the astronomer, the atoms are simply centres of gravity; and for him molecular forces and ethereal media are non-existent. Each atom attracts every other with an intensity which varies inversely as the square of the distance; and he needs no other assumption. But the physicist who studies other phenomena needs other assumptions. For him the atoms split up into two great classes of ponderable and imponderable, and are endowed with various molecular forces as well as with the universal force of gravity. Even these conceptions will be modified according as he studies heat or light or electricity or magnetism. The conceptions which are all-sufficient for one realm do not suf-

fice for another. The chemist also builds up an atomic theory from the facts of chemistry, but his conception differs very widely from that of the physicist. The physicist makes much of the ether; while the chemist has very little use for it. The physicist conceives of the atoms as endowed with universal forces; while the chemist endows them with selective forces. Except that the theories of both are atomic, they have very little in common. The mineralogist and physiologist in like manner introduce new conceptions.

Unfortunately, very little attention has been paid by students of physical science to comparing and supplementing the several partial views which have thus arisen. Indeed, it is not clear that these views admit of being united into a consistent theory. Thus the doctrine is held in each department with only such exactness as the facts of that department call for; and if the conception prove a fruitful one in practice, or even a convenient one for representing the facts to the imagination, little attention is paid to theoretical consistency or to agreement with the results in other departments. But, as thus held, the atomic theory can be viewed only as a convenient practical fiction like that of fluids and currents in electricity; for it would be intolerable that every department of physical study should have its own peculiar set of atoms.

These partial views might conceivably be united in one view which should embrace them all. But there are still deeper differences which touch the essential nature of the atoms themselves. Accordingly, atomism has all forms from the corpuscular philosophy of the Greeks to the centres of force of Boscovich and the vortex-rings of Sir William Thomson. The most common form is a modification of the corpuscular philosophy. In this view the atoms and the void play their familiar part; but the atoms are enabled to play the part by the addition of moving forces, which in

some mysterious way dwell in the atoms without being a consequence of them and yet are inseparable from them. Sometimes the atom is spoken of as the seat, or fulcrum, of the force, and the force is viewed as imparted, implanted, located, etc. In this view the most prominent feature is the crude working of the categories of being and causation under spatial conditions, and a still cruder conception of inherence.

It is also variously proposed to view the atoms as alike in essence but unlike in form, or as alike in form but as unlike in size, or as alike in form and size but unlike in grouping, or as alike in these respects but unlike in energy or in intensity of action; so that difference of atomic weight, for example, shall not depend on a difference of size or quantity of matter, but on a different intensity of attraction; and, finally, it is proposed to view the atoms as qualitatively unlike apart from all quantitative and geometrical relations. Some of the atomic theories view the atoms as having all the properties of the bodies about us; and others view them as essentially unlike the bodies which they found. The former are more in harmony with our spontaneous thinking, while the latter are more speculative and critical. But whenever any of these views claim to be more than convenient practical fictions, they must at least be self-consistent, and they must also meet those general demands which we make upon all reality. To determine the specific properties of the atoms will always belong to inductive science; to determine their general outline is the work of metaphysics.

The corpuscular, or lump, conception of the atoms has one very great advantage; it is easily pictured to the imagination, and calls for no effort of thought. It takes only the conceptions of space, form, and solidity with which we are familiar, and, with these, claims to solve all the prob-

lems which phenomenal matter presents. But, on the other hand, it has a methodological difficulty in that its explanations are but repetitions in the mass of what is given in the unit. On this theory there can be no explanation of any property of body which is not first assumed in the atom. This is especially the case with extension and solidity. The extension of the mass is viewed as the sum of the extensions of the atoms, and the solidity of the mass is viewed as resulting from the solidity of the elements. Moreover, this theory has always had an idealistic factor in it by virtue of its excess of materialism. Looking at the moving atoms with the eye of pure reason, we see nothing but quantitative distinctions and relations. Qualitative distinctions and relations are contributed by the mind of the spectator, and these constitute the chief problem for explanation. Without the spectator the problems would not only not be raised; they would not even exist. A mind which could completely grasp the moving elements as they are in themselves, but not as they appear, would miss the most important problems of the system. Thus we reach the paradox that an absolute knowledge of the system would find in it very little that would demand interpretation.

The corpuscular philosophy finds its purest illustration in the atomism of the ancient Greeks. The two factors of their view were the atoms and the void. The atoms were viewed as absolutely solid, and as secure in their solid singleness against all division and destruction. Moving forces were left out of the account altogether. But, apart from the fact that the mutual independence ascribed to the atoms made all interaction, even of impact, impossible, it has long been recognized that such atoms would explain nothing. In particular, the facts of chemistry call for an atomic conception which has little but the name in common with the ancient atomism. The atoms which modern science

calls for are atoms which are not in mutual independence and indifference, but which are parts of a whole, and which are not left to chance as the ground of their orderly combinations. On this account the new conception of motor-forces has been added. But these forces have generally been added in a very clumsy way. A passive solidity has been assumed as a foundation; and then forces have been imparted to this inert lump in a highly mysterious fashion. No information is given as to where the forces come from, or what their inner relation is to the matter which they are said to inhere in or inhabit. And yet, though matter and force are thus brought together by an act of pure violence, and though neither seems to give any account of the other, an edict is issued against separating them, and it even passes into a first principle that there is no matter without force, and no force without matter. Meanwhile the corpuscular conception of the atom as absolutely solid and as having a changeless volume is retained; and then, to make room for motion and to account for the form and coherence of bodies, these atoms are held apart and together by their forces, and at distances compared with which the diameters of the atoms themselves are very small.

But from this stand-point the need of viewing the atoms as corpuscles, or minified matter, disappears entirely. The phenomenal solidity of bodies, which is the only solidity of which we have any knowledge, is no longer the integral of the solidities of the atoms, but is purely a product of a certain balance of attractive and repulsive forces between the elements, and does not represent any property of the elements themselves. If we allow that the elements have an absolute form and solidity, we have also to allow that they never come into play in accounting for the properties of body; and that these properties are all the outcome of a dynamism which in itself is totally unlike the properties

which it founds. Each element excludes others from its own space, not by a passive solidity, but by an active repulsion. Indeed, solidity considered simply as space-filling could offer no resistance at all to the entrance of other bodies into the same place. If there were things between which no relation of repulsion existed, there is no assignable reason why they should not absolutely penetrate; and some speculators have suggested that chemical union may be of this sort. The mistake of this notion does not lie in a metaphysical impossibility, but in its inadequacy to the facts, pre-eminently those of isomerism. On the other hand, a solid without cohesive forces could not exist, for in every such solid it would be possible to distinguish different parts; and the only reason for the coherence of these parts must be found in cohesive forces between these parts. Hence, in any case, solidity must be second, and not first. The facts, then, are (1) that in determining the properties and form of bodies we are referred, not to similar properties and forms of the elements, but to their dynamic relations, whereby they found the properties and forms of bodies; and (2) that solidity, by its very nature, must be a product and not an original and changeless attribute. No atom can be regarded as having an absolute and changeless extension, but rather by its own energy it asserts for itself a certain position and volume, from which only a greater power can drive it. These simple facts serve to show that the chief qualities of bodies, which we may sum up under the term materiality, are products of the interactions of the elements, and not properties of the elements themselves.

The chief reason which remains for the corpuscular conception is that which originally produced it. This is not its scientific value, but its picturability. The atom as a dynamic element, or a centre of force, is as unpicturable as a soul. The imagination, therefore, is relieved if allowed to give it

an extremely small but fixed form and volume. It seems easy, then, to tell what it is and where it is; while the dynamic conception is comparatively hard to realize; and withal the dynamic view seems so to dematerialize matter as to be scarcely distinguishable from idealism. These considerations more than anything else have kept the corpuscular conception from universal rejection. The general tendency of physics is towards the dynamic conception of the atom in so far as the atom is retained as real, but in sluggish minds the old view maintains a more or less undisturbed existence. The tendency towards dynamism is partly due to the general unwillingness to explain the same by the same, which is the case with the corpuscular theory, and partly due to the fact that the latter theory is involved in the gravest metaphysical difficulties. If the atom be real it must be an agent, and its properties must depend upon its agency. It must also be a unit. But in a previous chapter we have seen that the extended cannot be a unit. An extended body is possible only as the parts cohere, and this, again, is possible only as they are connected by a system of attractive forces. In such a case the atom appears as a system of attracting and repelling points, each of which is the centre of forces distinct from those of all the rest; and thus we should be led directly to the conception of centres of force. Possibly we might retain the indivisibility of the atom in such a case, but only by making the attractions greater than any possible dividing force. But even this very questionable notion would not save the unity of the atom. It would have a unitedness rather than a unity. Only that is a unit whose states are states of the entire being. Any conception of states which are states of parts only and not of the whole, as when atoms are conceived as having opposite forces at opposite ends, cancels the unity and with it the reality.

So long, then, as a passive and extended solidity is viewed as an attribute of the elements their unity cannot be maintained. Hence we conclude that the corpuscular conception, even in its modern form, must be abandoned both as unnecessary and as hostile to the unity, and thus to the reality of the atom itself. Either we must regard the atom as a convenient, practical fiction, or else we must view it as a true agent, which, by its activity, founds without having the properties of phenomenal matter.

But we are certainly not out of the woods, even with this result, so long as we allow that the atoms are really in space. In that case the atom becomes merely a punctual agent, having location without extension; and this notion, when closely looked into, grows more and more bizarre. But if we carry the atoms into the non-spatial realm as a set of unpicturable agents, they lose all representative value for the imagination, all logical value for the understanding in its explanation of phenomena, and finally metaphysics proceeds to dissolve them away into forms of an energy not their own, thus cancelling them altogether as ontological facts. These are specimen difficulties in the notion of matter as having more than phenomenal reality.

Force

This general uncertainty of physical teaching concerning the nature of matter appears equally in the doctrine respecting its forces. Here, too, the metaphysics of physics is hopelessly confused, owing to the superficialities of sense-thought uncorrected by critical reflection. The notion of force arises from the need of importing causality into the problem, and as the atoms are easily fancied to be the only things concerned, the force is distributed among them as its subjects. This is done in a way which causes no practical

mischief, but which leaves things metaphysically at very loose ends. The current notions and phrases about force are supposed to be justified by the formal necessity of affirming causation. It is worth while to consider, if we are to speak of atoms at all, how we must conceive of them and their forces.

In discussing being we pointed out that force, as commonly conceived as inhering in things, is purely an abstraction from certain forms of activity; we have now to attempt some nearer determination. The common conception is that separate forces reside in the thing, and that the thing is the home or seat of the forces. But this view rests on the notion of pure being and on a hypostasis of force. The result is an impossible dualism, in which the being does not explain the force, and yet the force is nothing apart from the being. To this absurdity we are led by mistaking the distinctions of language for metaphysical facts. Scarcely better is the definition of force as the unknown cause of phenomena. This makes force at once a thing, for only things can be causes; and it also dispenses with everything but force, for the sole aim of speculation is to find the causes of phenomena. But this view at once proceeds to stultify itself by next providing something else, which, in some mysterious way, possesses or supports or uses the force. The fact, however, is that the elements are so related to one another that, when certain conditions are fulfilled, they manifest peculiar activities, which activities, however, are always the activities of the things themselves, and not of some inherent forces. Of course, they could not act as they do if they were not what they are; but the power to do what they do is developed in the moment of the action.

We must here refer to our general conception of the system as composed of a set of things which mutually

change as the plan of the system requires, so that each thing is what it is, and does what it does, because all the rest are what they are, and do what they do. In such a case, the being of everything changes from moment to moment, and its possibilities vary with it; indeed, its possibilities and its actualities are strictly identical. We do not conceive being, then, as having inherent forces, but as passing from one form of manifestation to another as its circumstances vary. We should say, then, that a new activity does not spring from an inherent power coiled up within it, but from a power acquired in the moment of manifestation. We may illustrate this by the intensity of attraction between two elements. At each new distance they attract with new intensities. These were not something in the thing, nor something put into the thing; they are developed at every point. Any given intensity represents the energy of action which the general relation between the two calls for at any given point. In the same manner, the different forces of things, as well as the different intensities of the same force, are acquired at the time of action, and represent only the forms of action which the nature of the system calls for in their special relations. But, since these activities fall into certain classes, we abstract a specific cause, which is not merely the thing, but some cause in the thing. This is a confusion of cause with ground. The cause of an act is the agent itself. The ground of the act is that peculiarity of nature which, under the fitting conditions, makes it the cause of that act, and not of some other.

We may say, then, that a thing is perpetually acquiring new forces and losing others, according as its relations change. The conditions of some of these manifestations may always be fulfilled, as in the case of gravitation. The conditions of some others may be fulfilled only here

and there, and now and then. Such are the chemical, magnetic, and electric manifestations. Coexistence in the infinite seems enough to secure the first manifestation; the conditions of the others are far more complex. When we know the order of their appearance, we have their law to a certain extent. When, in addition, we know the law of their variation, which, in physical forces, is some function of the space between the interacting bodies, then we have a formula which can be used for mathematical deduction. It is this fact which constitutes the fruitfulness of the law of gravitation compared with the law of affinity or of cohesion. The former law admits of exact mathematical expression, and its conditions are simple; in particular, the mass admits of being treated as a unit located in a point. The problem of three bodies fails to give a hint of the unmanageable complexity of astronomical problems which would result if this were not the case. But the law and the circumstances being simple, and admitting of mathematical statement, they admit of deductive calculation. In the case of affinity, the circumstances are not so simple, and the law admits of no mathematical formulation, and here we are practically restricted to observation.

Our conclusion, then, is that force as used in the physical sciences is not to be regarded as a something resident in the atoms, but rather as an abstraction from the various forms of atomic activity, and the laws of force are only the formulas which express the conditions of these forms of activity, and sometimes the rate of their variation. This, of course, on the supposition that the atoms may be viewed as ontologically real, and that we are to speak of them as having forces. The alternative view is to drop the language of causality altogether except in an inductive sense and confine ourselves to studying the laws of physical changes.

Physical metaphysics finds a still graver difficulty in the

relation of the atoms and their forces to space. To sense thought, of course, it seems sufficient to say that the atoms are in space, but we have seen that this is a very dark saying when metaphysically understood. Sense thought finds it equally a matter of course that the forces should vary with the distance. But more or less of empty space does not seem, upon reflection, to contain the least ground for the variation of force. The idea attributes a kind of resistance to space which must be overcome before the object can be reached. And since, on the most realistic view, space does nothing, the existence of a thing in this or that point in space is no ground for change in the thing itself. Space-position, therefore, on any theory, must be viewed not as a cause, but an effect; it is the result of the interactions of things whereby they prescribe to one another the position they shall have in real or apparent space. But this place-determining power is a purely metaphysical one; it is not determined by position, but determines position. Its own determining ground must be sought for in the idea, or nature, of the whole, which is the ultimate source of all law and order. We cannot take any other view without either reasoning in a circle or making space an active thing. Hence it follows, as we have seen in discussing the nature of the infinite, that the whole cannot be construed as the result of its parts, but the parts can be understood only from the side of the whole. The parts are not independent seats of independent forces which by combination generate an apparent whole; but the parts have their existence and their properties, or forces, only as demanded by the meaning or nature of the whole. But though space itself can never be regarded as the real ground of force-variation, it may be treated as its measure in calculation, because the changing space-relations are accurate exponents of the changing metaphysical relations. Hence we can deal with

the former with as much certainty as if they were the latter.

Nevertheless, the fancy is entertained by many that empty space itself is a sufficient reason for force-variation. Our physical experience teaches us that we can act directly only on things within reach; and even then we must not be at arm's-length. This most vulgar fact seems to be at the bottom of our notion that force must vary with space. This fact is further aided by an alleged explanation drawn from the geometrical nature of space itself, and the result is a claim that all central forces must necessarily vary as the inverse square of the distance. The explanation and the claim are totally baseless. They are founded on the notion that force is something streaming out from the element as a kind of aura flowing from a centre. If this view were allowed there would be a certain explanation both of the diminution of force with the space and of the law of the inverse square; for as the surface of a sphere varies as the square of the radius, it follows that with twice the radius the surface would be four times as great. Hence the outflowing aura would be distributed over a fourfold surface, and hence, again, it would only be one-fourth as intense on the unit of surface. But we are freed from this notion, which is plainly only a product of the imagination. Nothing streams out from being, and force is only an abstraction from a thing's activity, and never a thing itself. But the imagination always wants a bridge on which to cross, and hence it forms the notion of a passing and repassing thing, and thus exchanges the notion of force acting at a distance for the old view of action by impact.

If, however, the passing force be a real something, we must know where it comes from, and how the atom can forever generate this reality so as to fill space with it. If the force be only an influence, then we have simply a figure of speech

as the cause of effects; but if the force were allowed to be a real something, which passes from thing to thing and produces effects, our difficulties would be greater than ever. An outgoing ether would not explain attraction, and if it did it ought to be as attractive on the farther as on the nearer side of the body to be moved. No body cuts off the influence of gravitation by interposition, and hence the force which, reaching the earth from the sun, attracts it towards the sun, forthwith emerges on the other side, and ought to attract it from the sun. There seems also to be no reason why the force should attract in the line of its own motion rather than in any other. This theory does not conceive force as a tense cord, but as a moving something; and hence when it reaches a body and causes motion that motion might be in any direction. Some have sought to escape these whimsical difficulties by the additional fancy that a resting sphere of force is encamped around every atom; but this view disposes entirely of the attempt to deduce the law of force-variation from the nature of space, as that rests on the assumption of movement from a centre. This attempt is further forbidden by the fact that, if space be the real ground of variation, there can be only one law of variation, as space is always and everywhere the same. And if only one law, then there can be only one, or no, force in the system. For if there were both attraction and repulsion, and they were balanced at one point, they would be balanced at all points, and would cancel each other. If, on the other hand, one were stronger than the other at one point, it would be so at all points, and would banish the other.

In speaking of space as a ground of force-variation we denied that it can be such ground. But may it not make all action at a distance impossible? If related to force at all, it seems better able to bar its action than anything else. This has long been a vexed question, almost a black beast,

in physical speculation; and certainly on the received theory which locates individual atoms in a real and empty space, it is a rather tough problem. If we conceive a multitude of individual atoms separated from one another by an absolute void, it is utterly impossible to bridge over the abyss between them by anything but a pre-established harmony; and this would only simulate action at a distance. The void would imply and express the absence of all essential relation. Newton, therefore, in his letter to Bentley, insisted that no one with a moderate reflective power could imagine that the gravitation of the elements is due to any action of the atoms themselves. And, indeed, it does seem incredible that the infinitesimal atom is really filling space with its influence to the farthest atom of ether or star-dust, and yet without any knowledge of itself, or its fellows, or the spaces across which it acts, and yet adjusting itself absolutely, instantaneously, and incessantly to each minutest change of distance, in not only one but all the atoms of the system. Accordingly, there has always been with physicists an anxiety to fill up the void with something through which action should be transmitted, and the result has been the generation of a more or less numerous family of ethers. This anxiety, however, rests upon the notion that action is more intelligible when between contiguous things than when between things separate in space. But we have seen, in discussing interaction, that contiguity in space does not remove the difficulty of interaction, as this lies in the opposition of the notions of independence and community; so that not action at a distance, but action at all between two things assumed to be independent, is what reason finds so difficult. The attempt to dispense with action at a distance must really deny all attractive and repulsive forces to the elements, and either appeal at once to a co-ordinating and moving force in matter which is not of matter, or it must reduce all material action to impact.

The latter alternative has often been chosen by physicists. When the dynamic view of matter was first proposed, the general objection to it was that it was a return to the scholastic doctrine of occult qualities. The present conception, which endows matter with moving forces, was for a long time resisted on this ground, and the demand was made that all material phenomena be explained by the laws of motion and impact. The same unrest with the mysterious implications of gravity often reappears in attempts to explain gravitation by the impact of some assumed ether atoms. To begin with, these attempts are all utter failures. The phenomena of cohesion and affinity utterly defy any attempt to explain them as the results of impact; while the implications of the impact theory are without a shadow of warrant. But, in the next place, impact is far from being so simple as this theory assumes. On the ordinary theory, there is no contact whatever of the elements, and they are held apart by repulsive forces of such a kind that only an infinite force could bring the elements in contact. On this theory, then, impact itself assumes action at a distance. And, in general, if force acts at all between the atoms, it must act at a distance. An attractive force which did not act at a distance could never make itself known as attraction; and a repulsive force which did not act at a distance would not be repulsion at all.

To see this, conceive two solid cubes endowed with repulsion which, however, cannot act at a distance. If these cubes occupied the same space, their repulsions could not result in motion, no matter how intense they might be, because they would be balanced in every direction. If now they be pressed together, there is not the slightest reason why they should not telescope each other. In the first place, such bodies would meet only in the geometrical plane which separates them, and all the resistance to interpene-

tration must lie in that plane. But the plane itself is nothing but an imaginary surface without resistance; and hence the resistance must come from the parts on either side of the plane. If, however, we should allow that each body has a certain part of itself in the plane, then those parts which are in the plane would strictly coincide, and, as coinciding, there would be no reason why the repulsion between these parts should take one direction rather than another; and it would practically be cancelled, so that the true repulsion would still lie between those parts on either side of the plane and external to each other. But as by hypothesis these parts cannot repel because at a distance, there is nothing to hinder the two bodies from sliding together under pressure. This result would be reached even if we should allow the atoms to be solid and in absolute contact. We should still have to posit action at a distance. But, as we have frequently seen, there is no reason for supposing that atoms are solid; they are rather the immaterial ground of phenomenal solidity. So, then, we seem shut up to affirm action at a distance.

But here a new difficulty emerges. If we allow the general possibility of action at a distance, we seem likewise shut up to the paradoxical admission that there is no longer any reason for believing that a thing is in one place rather than in another. How do we know that the things which, by resisting our effort and coercing our sensations, create in us the perception of a world about us are not really located beyond the bounds of our solar system? Crude common-sense, of course, would reply that it is directly cognizant of the very being and location of things; but every one competent to speculate at all knows better. He knows that we cognize things only through their activities upon us, and that if these activities were maintained, our world-vision would remain unaltered, no matter what hap-

pened to the things. But since action may take place at a distance, why may not the things which act upon us be located at any point whatever in space? And since, in the popular theory at least, the void is no bar to action, why may not things be in some extra-siderial region, and only manifest themselves in our neighborhood?

If it be said that existence in space means only that a thing acts at a certain point, common-sense is disturbed, for it thinks it means more than this by existence in space, and in addition the difficulty is not removed; for if a thing exists in space at all, then, on the hypothesis of action at a distance, the fact of action at a point does not prove that a thing is there. Moreover, the atom acts at many points; is it in all of them? By our unfortunate admission of action at a distance, we have deprived ourselves of every valid test of the true whereabouts of things. We may fancy that in resistance we have such a test, but this, too, is untenable. Both attraction and resistance may point to a certain centre, but this is far from proving that the agent is really there; for since action may take place at a distance, it is quite possible to view the point as the radiating centre of atomic manifestation only. The claim that the atom must be at the crossing of the lines of attraction and repulsion depends on an assumption which is not self-evident. This assumption is that an atom can cause another to move only on the line which joins them; but, on the hypothesis of action at a distance, it is especially hard to see why the movement might not take place on any other line whatever. Of course, attraction means a drawing-to; but etymology will not help us in this matter. If, then, action at a distance be allowed, it is theoretically possible to claim that, for all we know, the real agents of the system are removed from it by the whole diameter of space. But this is so revolting a paradox that it would hardly seem more irrational to claim that

things may act in some other time than the present. Besides, on this admission, the bottom would fall out of the atomic theory itself. The great reason for admitting separate atoms is the desire to locate an agent at the centre of attractions and repulsions; if we locate the agent elsewhere, the only theory which would be satisfactory in any way would be one which allowed one and the same agent to do all the work. To complete the paradox, we must add that if we insist that a thing is wherever it acts, then we have to attribute a kind of omnipresence to every atom; as every atom is said to attract every other, that is, to act upon every other. This view would be embarrassing enough. It would lead at once to the previous conclusion, that there is no warrant for saying that the atom is in one place rather than in another. It would, indeed, be in every place and everywhere as one and the same atom. Thus we should have a very peculiar kind and case of omnipresence.

These bizarre difficulties are specimens of the rational scandals, offences, and impossibilities which infest the metaphysics of physics. The attempt to construct a system out of atoms and the void alone shatters on these and similar absurdities, and it is impossible to escape all of them on any theory which allows the substantive reality of space. Practically, as we have said, these notions work no mischief, for the important work of science consists in finding the laws of phenomena; and in this work these metaphysical crudities remain harmless in the background. But when they are brought out of this retirement and paraded as scientific and final, then it is in place to point out that they are neither data nor inferences of any sound science, but only hypostases of unreflective sense-thinking. With the best of wills it is impossible to save them from destructive metaphysical criticism, when they claim to represent the ontological fact of existence.

Motion

The traditional doctrine of motion and its relation to matter contains various difficulties which deserve to be mentioned before setting forth its phenomenality. We return to the view of spontaneous thought and work away from it.

Motion is indefinable, except in terms of itself. Like being, change, and action, it must be accepted as an idea which cannot be constructed out of anything else. If we define motion as a change of place, or as a passage from one point of space to another, we but define the same by the same. The change of place, or the passage from point to point, is unintelligible without the intuition of motion itself. To one who has the intuition, such definitions serve to unfold its implications, but to one without the intuition they are as useless as a definition of sight is to the blind.

The Eleatic Zeno's claim that motion implies contradiction is sufficiently disposed of by a correct doctrine of change. In modern times a series of even more superficial objections have been based on the antithesis of absolute and relative motion. Absolute motion is declared impossible, and the universe, as a whole, is said to rest. Rest and motion, then, are alike relative and real only as relative. These objections may have puzzled many, but have probably convinced none. They simply leave the mind in that most uncomfortable position of being sure that there is a fallacy without being able to point it out. But, in this case, it is not difficult to detect both the error of statement and the fallacy of argument. The former is discovered by simple definition. Absolute rest can only be defined as continuous existence in the same position in absolute space. Absolute motion, therefore, would be the successive occupation of different positions in absolute space. If, now, there is no ab-

solute motion, then all things are absolutely at rest, or remain in the same points in absolute space. In that case, relative motion, which is declared to be real, becomes a mere delusion, with no ground whatever. If, then, we hold that motion of any kind is more that a phenomenon, we must affirm the reality of absolute motion, and view relative motion only as the way in which sundry absolute motions appear from our stand-point.

The fallacy of the argument against absolute motion is no less easily detected. It consists in assuming that the mental co-ordinates by which thought grasps the fact are necessary to the fact itself. We are told, for example, that absolute motion is indistinguishable from absolute rest, because motion implies fixed points of reference, and in absolute space there are no such points. All the points of space are alike; there is no here and no there, for these terms are purely relative to the spectator. But motion is a passage from here to there, and hence is always relative to the spectator, and therefore impossible in pure space. To all this the reply is that motion is, indeed, grasped and measured in thought only by setting up some point or axes of reference; but these mental co-ordinates are nothing to the motion itself; least of all do they make the motion. We cannot define or represent a motion to ourselves, without assuming some stand-point in relation to which the motion is to be measured; but the motion itself is under no obligation to be represented, and moves on according to its own laws, whether we think of it or not. It certainly never occurs to the astronomer to fancy that the celestial equator and meridian, to which he refers the stellar motions, make the motions. He recognizes that these planes of reference are but the makeshifts of our minds in order to grasp the fact. If, then, absolute space were real, there need not be the least difficulty in admitting absolute motion. The fact that every point

in such space is distinct from every other point would suffice for its affirmation. The entire system might be viewed as journeying through infinite space, or as revolving in it. Such a conception of the entire system, of course, could never be tested, for no facts whatever could prove or disprove it. Nothing short of a revelation would suffice for a decision. Applied to our solar system, however, it would represent the fact. Its centre of gravity is in motion, and the system, as a whole, revolves. In addition, the planets themselves are revolving on their own axes in absolute space. To conceive such motions, we need points of reference; but the existence of the motions, if space be real, is quite independent of our thought and its scaffolding. Possibly it may be urged that motion is, at least, relative to space itself, and that when space itself is reckoned as a part of the system, motion can only be relative. This may be admitted. Space does not move, and motion is in space. But this motion would change the definition, and cancel the problem altogether, in any intelligible sense.

Concerning the relation of motion to reality, the history of speculation shows a complete change of view. The ancients, without exception, held that the natural state of things is rest. Things are put in motion only by external agency, and, resigned to themselves, come quickly to rest again. Motion was regarded as a "violent state" of things, and the moving thing was supposed to have an inner struggle to escape from it. The source of this belief is evident. In our sense-experience, we have abundant illustrations of the cessation of motion and of the difficulty of initiating it. Besides, we find in ourselves a weariness, resulting from continued effort, which compels us to seek repose; and this, by a kind of mechanical anthropomorphism, is easily transferred to things.

This view of earlier speculators has given rise in later

times to the opposite idea, that motion is the natural state of things. The conception of matter as having no principle of movement in itself, and as tending to rest, led necessarily to the doctrine of at least a prime mover in the universe, who should also be immaterial. But such a view could hardly help giving aid and comfort to theistically inclined speculators, and could not fail, therefore, to be obnoxious to such as did not share such tendencies. These side-issues have not been without their effect in mechanical speculations. A more respectable ground of the view is the desire to escape admitting any moving forces in matter. With this aim, various theories of molecular vortices have been invented, in which atoms originally endowed with motion are made to produce all material phenomena by simple variations of the rate and direction of motion. But, whatever the source of the doctrine, it is hard to give to natural any clear meaning in this connection, and, in its obvious sense, the doctrine is false. If motion were an essential and inalienable endowment of every element, and not a variable product of moving forces, it might be called natural to matter. In such a case, any element left to itself would move with a fixed velocity, as a result of its own nature. But this view is untenable, and leads to results directly contradicted by the facts. It may well be that motion is a universal fact, as an effect of the moving forces of the elements; but this is far from making it an inherent and essential attribute of matter. In fact, motion is neither natural nor unnatural, but a condition in which matter may or may not be; and in this sense matter may be said to be indifferent to motion. If in motion, it remains in motion; and if at rest, it remains at rest. This is the only view which does not conflict with the law of inertia—a law which, whether an *apriori* truth or not, is still too well attested by consequences to be questioned as to its validity. The motions of the elements

are the products of their interaction, and the condition of any element, whether in motion or at rest, has its external ground.

But this indifference of matter to motion must not be confounded with the claim that matter is strictly the same, whether at rest or in motion. This view rests partly upon the abstractions of mechanics, in which matter appears as the rigid and indifferent subject of motion, and partly on the fact that matter can begin and cease to move without any change of its prominent qualities. Hence unreflective thought, which thinks mainly under the law of identity, holds that matter in motion is the same as matter in rest. Now, whatever view we may take of motion, this view is false. The motion of a thing is simply its successive appearance at the successive points of its course. But this succession must have some ground. A moving body, at a given point of its path, differs from the same body at rest in the same point; otherwise the effect would be the same. It is idle to say that the difference is that one moves and the other rests, for the movement of the first is but its passage from the point in which it is at any instant to the contiguous one, and there is no ground for this passage, unless the moving body have a different internal state from that of the resting one. No more does it avail to say that the ground of the motion is the attraction of other bodies, for this attraction acts by no external grip or drawing, but by producing a new state in the thing, and this state is the immediate ground of the new manifestation. Motion, therefore, is but the spatial manifestation of a peculiar metaphysical state in the moving thing itself, and this state is what distinguishes the moving from the resting thing. Without this admission, we cannot escape Zeno's conclusion that motion is impossible; for, at any point of time, the moving body is at a given point in space, and if at that

time and point it is metaphysically the same as if at rest in the same point, then the moving body rests, and can never move. Both the law of inertia and that of causation would forbid its motion. The latter would forbid it for the lack of any ground for the motion, and the former would forbid it because the body, being at rest in a point, must continue so. We must, then, admit that, even in the indivisible point of time in which there can be no spatial manifestation, the moving body differs from the resting one by an internal state, which is the true ground of the motion. To this state we give the name of velocity. In itself, velocity is not motion any more than a force is a line. Motion is a measure of velocity, just as force may be represented by a line, but both alike are forever different from either motions or lines. If velocity itself were motion instead of its ground, then, in a point of time, a moving body could have no velocity, and hence no ground for passing from the point of space in which it might be. But, at any instant, a moving body has velocity which is not made, but measured, by the space passed over in the unit of time. If the velocity be variable, then it is measured by the space passed over in the unit of time, supposing the velocity to become fixed at the instant of measurement. This fact implies that velocity itself is quite different from its measure. It is that inner state of a thing of greater or less intensity which impels it incessantly to change its place. While, then, we can represent it as the quotient of the space and time, or as the first differential coefficient of the space and time, we must not identify it with either. Such a blunder would be like identifying the lines and differential coefficients which represent force with force itself.

This necessity, supposing that material things are ontological realities, of referring all change and movement to metaphysical states in the things, leads to a peculiar para-

dox when we affirm a real motion in a real space. Motion is the result of an internal state; and direction is given in the same state. Motion and direction are inseparable, and both are the outcome of a peculiar inner state. This fact leads to a rather odd conclusion. Spontaneous thought finds no difficulty in affirming the existence of a thing in space, and also the mutual indifference of the thing and space. Space is not altered by the thing's presence or absence, and the thing is not affected by change of place. It is, then, quite indifferent to the thing whether it be in one point or another. The solar system moves through space, but remains the same. But, curiously enough, this indifference cannot be maintained when the things begin to move; for then difference of direction, as well as difference of position, becomes possible. The first impulse is to say that difference of direction also makes no difference to the thing, that a thing moving north is in no respect different from one moving west. But this impulse is misleading. The difference of direction must have some ground in the moving things, and this can only be found in some peculiarity of internal condition, which holds one to its northerly and the other to its westerly direction. Without this assumption there is no reason why direction should not incessantly change. If we should fall back on the law of the sufficient reason, we should be especially unfortunate; as the lack of any state determinative of direction could only result in the thing's coming at once to a standstill. It will likely be urged that there is sufficient reason for the thing's going straight ahead, in that it is actually moving in that direction. If, then, a thing moving west were internally exactly like one moving north, still each would continue its proper motion because already in it. This seems clear, but is really unconvincing. For motion is simply the successive existence of a body at successive points; and the fact that a

body has been at points A, B, C, etc., is no reason why it should pass through the points X, Y, and Z. At any given point of time, there must be some reason why the next increment of the path should be in one direction rather than another. The path passed over is not in the thing, but behind it. Direction, geometrically considered, cannot determine anything. Why, then, shall the body at any point of its path take one direction rather than another? There is nothing to do but to declare that motion and direction are given as inseparable elements of the same internal state, and that this state varies with the direction. But, on the other hand, possible directions are numberless; and we are shut up to the affirmation that for each one of the directions there is a special and peculiar inner state. Thus we should have to give up the indifference of things to space, and declare that all directions, if not all positions, in absolute space have their representatives in the metaphysical states of matter. This paradox the realist might find it hard eitherto escape or to admit.

Before speaking of the general laws of motion, a word must be said about its continuity. This is an idea more often mentioned than understood. A familiar misunderstanding makes it mean that motion has a constant quantity, a fancy which has long been superannuated in physics. Those who hold it seem to think that they have the support of physical science; but the conservation of energy, which they apparently have in mind, is a totally different doctrine.

But the continuity of motion is itself an ambiguous phrase, as it may refer to space or to velocity. A very excellent work on mechanics contains the following definition: "Motion is essentially continuous; that is, a body cannot pass from one position to another without passing through a series of intermediate positions; a point in mo-

tion, therefore, describes a continuous line." Here the doctrine is referred to space alone. But as originally expressed by Leibnitz, and as commonly understood, it refers rather to velocity, and means that a moving body, in passing from one velocity to another, passes through all intermediate velocities. In this sense of the law Leibnitz and his followers regarded it as a self-evident truth, and from it they deduced a number of propositions, notably that absolutely solid bodies cannot exist, as the collision of such bodies would also collide with the law of continuity. Others have deduced from the same law both the necessity of moving forces in matter which act at a distance, and also the punctual character of the elements. It is plain that if two absolutely solid bodies collide, the change of velocity must be instantaneous; for the moment of collision is indivisible, and if they rested for two consecutive instants the law of inertia would keep them at rest forever. There would, then, be an instantaneous passage from motion to rest, or from rest to motion, or from one velocity to another, and thus the law of continuity would be broken. Hence bodies must begin to act upon one another before the time of geometrical contact; and hence must be endowed with moving forces which can act at a distance.

In neither of these senses is the continuity of motion a necessity of thought. The ideality of space makes it entirely possible that phenomena should appear in one position and reappear in another without appearing at the intermediate positions. If such is not the order of experience we must view it simply as a fact, and not as a rational necessity.

Just as little is the continuity of velocity a rational necessity. The reasons given for the doctrine are mostly inconsistent with one another. It is said, for example, that velocity cannot increase by leaps without implying that the same body has two different velocities at the same instant;

but this is the same fallacy which appeared in the objections to change. Instant is taken to mean a short duration, whereas in the case assumed it would not be a duration of any sort, but a limit. It would express the point of time when one motion ceases and another begins. On one side of the point the velocity would be v, on the other side it would be v_1. Moreover, these objections are inconsistent. They do not rest on the greatness of the increment, but on the fact of any increment whatever. Hence $v+dv$ is just as obnoxious to this objection as $v+v_1$, where v_1 is a finite velocity and dv is an infinitesimal. If, then, the objection were allowed, the changelessness of the Eleatics would be the necessary conclusion; and a variable velocity of any kind would be impossible.

The end aimed at in this argument is much better reached by saying that no finite force can generate a finite velocity in less than finite time. This statement will always be tolerably secure from attack, because the intensity of a force is measured by the velocity it can generate in a finite unit of time. If, then, a force should generate a finite velocity in infinitesimal time, it would generate an infinite velocity in finite time, and thus by definition would be infinite. But this conception, again, assumes that the force shall act incessantly like gravitation. In the case of absolute solids, impact would be attended by the generation or destruction of a finite velocity in a point of time; yet the force would not be infinite, because such impact would necessarily be instantaneous in its action. Through overlooking this fact, some speculators have affirmed that in case of impact the force must be infinite; but their argument has always consisted in confusing action by impact with action by moving forces. And hence we conclude once more that the continuity of velocity is a doctrine which holds only in a system which derives all motion from moving forces, which forces, again,

act not only through space, but also through time. And even in such a system the doctrine assumes the reality of time, as if time itself had a significance for action. In our view of time, difference in the members of the same series is time itself. It follows, then, that any series which admits of division in thought will necessarily appear to be in time; and as we can carry the division of velocity to any desired extent, velocity must appear as reached by infinitesimal increments whose sum becomes perceptible only in finite time. We view velocity as quantity, and measure it by number. But quantity admits of indefinite division; and hence we are forced to make the final units indefinitely small. But after we have posited such a divisibility, we must of course view the whole as the sum of the infinitesimal parts implied in our position. Their summation in reality, however, must be successive. Hence, even in the case of impact of proper solids, if a body should instantaneously pass from velocity two to velocity four, we should seek to divide the increment into parts which must all be passed through, and should then try to reach the instantaneousness of the passage by increasing its rate to infinity. It is this fact, that the divisibility of a series is time, which makes the continuity of velocity apparently self-evident.

We leave now these general considerations and pass to the more specific laws of motion. And fortunately we are not left to invent or discover these laws for ourselves, for the science of mechanics has done the work for us. We have, then, only to examine those laws which are found necessary in interpreting phenomena, and which are justified by experience. We remain for the present on the realistic platform.

The first and basal law of motion is that of inertia, according to which a body cannot start or stop itself. If at

rest, it remains at rest; and if in motion, it remains in uniform motion in a straight line unless interfered with from without. Many attempts have been made to show this law to be a necessity of thought, but without success. If the non-spontaneity of the elements be allowed, the law is, of course, an identical judgment, for the law is simply a denial of spontaneity with regard to space-relations. A change of condition is always an effect, and presupposes some cause; and if an element has no influence over its own states, of course all change must come from without. But when the point is to know whether the law is an *apriori* necessity, we must inquire whether there is any ground for saying that the elements must be of this sort. That they are such may be allowed; but that they must be such is not made to appear. The apparent self-evidence in the case is largely due to the abstraction of a material point with which mechanics is wont to begin. This point is conceived as the inert and rigid subject of possible motion, and in itself is so emptied of all quality as to contain no ground of activity of any sort. The deduction of the law from this conception is easy enough; but this conception is a pure figment of the imagination. As applied to a real element, even the first part of the law, which asserts that a body at rest will remain at rest unless moved by something outside of it, is not self-evident. It is not self-evident that an element, if it could exist alone in space, could not, whatever its nature, begin motion; for motion, as we have seen, is but the spatial expression of an internal state, and if that state were given, motion would result. It is not self-evident that the inner changes of such a thing could never result in that state which expresses itself in motion.

The common proof of the first part of the law consists in bidding us conceive a single element in void space, and in pointing out that there is no more reason why it should

move in one direction rather than in another. Then the conclusion is drawn that the element will remain at rest. But the law of the sufficient reason, to which appeal is here made, is a very treacherous ally. We could use it with equal propriety to prove that the atom could not be in space or in time. For every point of space or time is like every other, and hence there is no reason why it should be in one rather than in any other; and hence it cannot be in either space or time. It is well known that Leibnitz, the formulator of this law, was perpetually on the verge of pantheism because of its influence. But we may allow that there would be no reason in space itself for motion in one direction rather than in another; yet that would not prove that there might not be a reason in the thing. In no case does space determine the direction of motion; this is due to the interaction of things, and the point here is to know why an element might not of itself pass into that internal state which appears as motion. It is said that if it did, the motion would not arise from rest, but from an internal motion; but the series of metaphysical changes in things are motions only in a rhetorical sense. If, then, a thing could exist alone and maintain a series of inner changes in its solitary existence, it is not inconceivable that it should pass into motion alone. For all we can say, there might be a tendency in things to seek a certain state, as in elastic bodies, where any departure from equilibrium results in an effort to restore the balance. A better illustration is found in our own mental life, where every state is not compatible with inner harmony, and in which there is a corresponding effort to restore the internal equilibrium. Things, then, might be such as to be in conflict with themselves when forced out of a certain state, and hence they might have an inner tendency towards that state, and this state might be one which should manifest itself as either rest or motion, according to its nature.

But it has been further said that motion could not result even in this case, because direction is necessary to motion. If, then, this state which implies motion should exist, it could not produce motion because there would be nothing to determine its direction. Motion would be possible in any one of an indefinite number of directions, and as every one would have as good a claim as every other, the motion could not begin at all. This is a return to the doctrine of the sufficient reason, and does not reach the difficulty. Since motion involves direction, we should simply say that the state supposed to be produced would be one which should contain the ground of direction in it. Of course, the question comes up, Why one direction rather than another? And the answer must be a confession of ignorance. But for one who believes in the reality of space and time, the same question would arise concerning the existence of the element. It would be easy to develop a great astonishment over the fact that the atom should be in any one point rather than in some one of the countless other points, each of which has as good a right to its presence. And this astonishment would have as much ground as the wonder over the atom's motion in space. Provided the existence of an atom in space meant anything intelligible, its movement and direction would be no more wonderful than its existence in a fixed point. The fact, whichever it might be, would simply have to be admitted. Even in the actual system we come down to the same difficulty. It might be said that no thing can cause another to move by any attractive force, because the possible directions are infinite. The word attraction must not mislead us into overlooking this difficulty. It is by no means self-evident that motion must take place along the line which joins the bodies. For all we can say, it might be on any other line whatever. Hence the attracting body must also determine the direction, and

by the law of the sufficient reason this is impossible. But by the law of fact the conclusion is absurd. Indeed, the entire process by which this law is deduced is purely fictitious. The single atom in void space is a contradiction, because the atoms have their existence and properties only in the system of which they are parts or implications. The sole use of such a fiction is to impress the law upon the imagination. It should never be tolerated for an instant as an argument. But if we will resort to such a fiction, we must declare that, for aught any philosopher or physicist knows, a single element in space might be such as to set itself in motion.

The second part of the law is just as little an *apriori* truth on the current view of matter. To the unreflecting, indeed, it even seems false; but this is due entirely to the bondage of the senses. First, the constant direction is no necessity of thought. Direction itself is given from within, and not from without. Of course, in reality the direction is primarily determined from without, but only through an internal state, so that the thing is not drawn, but driven from within towards a certain point. The immediate reason why a thing is moving in a certain direction and at a certain rate is not found in external things, but in its own inner state. This is especially apparent on the current view that if outer things should all fall away, the thing would continue to move in the same direction and at the same rate. Direction, then, is finally given in the inner state of the moving thing. There is, therefore, no absurdity in supposing that a thing should change its own direction. That it does not do so is a fact, not a necessity. Here, also, appeal is made to the principle of the sufficient reason, and it is urged that there is no reason why the change should be on one side rather than on the other, etc. Of course, there is no reason in space, but to say that there is none in the

thing is simply to beg the question. This part of the law also is manifestly no necessity, but at most only a fact.

It remains to consider the last factor of the law of inertia, the uniformity of motion when not interfered with by external objects. This also follows necessarily from the assumption that a material element cannot change its own state; but it is no more a necessary truth than the other factors of the law. But, curiously enough, a better argument can be made for this part of the law than for the others. If we assume that a finite change is reached only through successive increments, and hence that a given change is only the sum of the increments, then it is plain that there could be no change without the law; and hence motion could never begin nor end, as this beginning or ending would be a form of change. If, then, motion can begin or cease, the law of inertia must be admitted as an implication of this fact. Taking the case of beginning motion, it is plain that if every increment perished as fast as produced, there could be no sum. Each new increment would begin with zero, and could never get beyond it. Let us take the case of a body falling from rest. At the end of the first unit of time, which may be taken as infinitesimal, the body has a certain velocity from gravitation. In the second instant, the body is supposed to retain the velocity acquired in the first, and to gain an additional increment; and so on in successive instants. If, now, we suppose the acceleration uniform, the velocity at the end of a given time will be the velocity acquired in the unit of time multiplied by the number of units. But it is plain that this could not be the case if the law of inertia did not hold; for the first increment of velocity, dv, in the first instant, dt, would perish at once; and hence the next increment of velocity would begin not with dv, but with plain zero. Hence at the end of any time, t, the velocity would still be zero, and the body would not

have moved. It may at first appear as if the body should have moved some during the several instants, dt, but this is seen to be a mistake, when we remember that as long as dt expresses a real duration, we cannot assume that dv remains constant through dt without assuming the law of inertia. The untruth of the law would make even this impossible, and hence each minimum increment of velocity would perish as soon as born. While, then, we cannot directly prove this part of the law of inertia, we can show that without it no motion could ever begin.

Respect for those who have urged this argument would incline us to accept it, if we held the realistic view, especially as it is by far the best argument advanced. It does not aim to show that the law is a necessity of thought, but that it is a necessary implication of admitted facts. It depends, however, entirely upon the assumed truth of the law of continuity, or on the assumption that no natural force can instantaneously produce or destroy a finite velocity. If, however, gravity were capable of instantaneously generating any finite velocity, motion would be possible without the law of inertia; for velocity would be renewed as fast as lost, and this would be equivalent to the constancy of the original velocity. In a fountain under constant pressure the column of water stands always at the same height. There is, indeed, incessant going, but there is also incessant coming; and the one balances the other. If gravity were a constant force, no acceleration could occur under such circumstances; but if gravity itself varied, variable velocity would result. Nor would gravity in such a case be an infinite force; for it would never generate an infinite velocity. The summation of the finite velocities instantaneously produced into an infinite sum would be impossible without assuming the law of inertia. This law not holding, the velocity would remain finite, and the present order would remain unchanged.

There is no need to consider the pretended proof from experience. Nothing remains at rest absolutely, and nothing moves with uniform velocity in a straight line. If a body be thrown into the air, it quickly loses its motion even in the absence of that friction which plays so prominent a part in the alleged experimental proofs of the law. Assuming the law to be correct, we must account for these variations by external forces; and we throw on these forces the burden of explaining the variations. But why might we not assume the forces, and throw the burden of explanation on the laws of motion? Or might we not, in the spirit of Leibnitz's monadology, find the ground of all change in each element alone, so that they shall have various laws of motion according to the demands of the system? In that case the laws both of force and motion would be only the components into which the facts fall for purposes of our calculation; and the agreement of fact and calculation would only prove the practical validity of the laws, not their reality. If things can exist independently, this view is as good as any.

Thus far we have considered this law from the common stand-point of a real space with things moving in it. This view we have found to involve some peculiar paradoxes concerning the relation of space to motion and direction. In addition we have found reason to complain of the method of proof. This consists in setting the moving subject apart in unreal abstraction, and then deducing laws for reality from purely fictitious and impossible cases. Thus the idea of a system is overlooked entirely, and the attempt is made to find the laws of the system by denying in effect that a true system exists. The individual has been assumed as capable of existing by itself; and against this view our previous criticisms are valid. Of such elements, one law would antecedently be no more probable than another; and

the validity of a law up to a certain point would be no warrant for its universality. If any deduction of this law is possible, it must be from considering the nature of the system and not from reflecting on those parts which have been hypostasized into an unreal and impossible independence. It may, then, be allowed to inquire whether any rational insight into this law of motion can be reached from the general character of the system.

Cosmology deals only with the system of nature, or with what we mean by the physical system. But in discussing interaction we have seen that it is impossible to construct a system out of mutually independent elements. The nature and action of each thing must be determined by the nature and idea of the whole. But this idea itself can determine nothing except as it is set in reality. Hence the logical implications of the idea are realized in the actual members of the system; and the demands of the whole upon each are realized through the mutual interaction of the members. Each, then, is what it is, and does what it does, because all the rest are what they are and do what they do. Interaction in general means simply the determination of one thing by another; and in a system where there is nothing but interaction the activities of each thing are necessarily objective, and the determinations of each thing are necessarily from without. But this is the conception we must form of the physical system. In it we know of nothing but interaction, or mutual determination. There is no ground for affirming any subjectivity or self-determination in them; and they are members of the system only as each is what the system demands. If in addition to their cosmological activity they also maintain an inner life, they belong by this element to the realm of psychology and not to cosmology. But a cosmology is possible only as the members interact and determine one another. Law and system

would not otherwise exist. Hence the law of inertia in its fullest extent must reign in such a system. No element can change its own state whatever it may be; but the ground of change must always be found outside of the element itself. If it were otherwise, then the state of an element at any moment would not be an expression of the demands of the system upon it; and this is contrary to the notion of a system. Not even the suggestion already made that things may tend to a certain state can be longer allowed; for things have no right to any state on their own account, but only to such as the state of the system as a whole demands. Hence change of any and every kind in a physical element must be referred to external causes. This is the law of inertia in its very broadest sense; and its application to motion is only a special and limited case. And we reach this conclusion not by considering such hypostasized impossibilities as the existence of a single element in void space, but by reflecting on the demands which a physical system must make upon each of its members. In so far as any of them are capable of independent action, they become rebels against the system or seceders from it. These considerations do not, indeed, prove the law to be an ontological necessity, for the system itself is no necessity; but they do prove that there can be no physical system without the law. We need not, then, doubt this law because we know nothing about the mysterious nature of things; for the existence of a system at all implies the law. Nor need the conclusion be confined to the physical elements alone. Even the finite spirit, to a very large extent, comes under this law; and so far as it does not, it exists in relative independence of the physical system. If the mental life were absolutely determined by our interaction with the system, the law of inertia, in its broadest sense, would be absolute for mind as well as for matter.

The law of inertia is the basal law of motion. In addition, two others are commonly given, which are as much laws of force as of motion. The first of these, the second law of Newton, is that the amount of motion is proportional to the moving force, and is in the direction of its action. The first part of this law is simple enough. Motion being an effect, must of course vary with its cause; and, besides, the intensity of the force is measured by the motion it causes. This part of the law could hardly fail to be exact. But the second part of the law contains implicitly the doctrine of the parallelogram of forces, and this is not so self-evidently true. We postpone its consideration, and pass to the next law, Newton's third law of motion, the equality of action and reaction. This is not properly a law of motion, but of action. In speaking of being, we pointed out that there can be no action without reaction. In such a case the object would in no way determine the agent, and the effect would be created outright. Hence all interaction involves reaction, and we may lay it down as an axiom of metaphysics that there can be no action without reaction. But this axiom in no way determines the nature and form of the reaction, and is far from giving us the third law of motion. This law of motion is, besides, thoroughly ambiguous, and is self-evident only in one, and that its least important, sense. The action and reaction may be purely static, as when one thing rests on another. In this sense the law is a necessity of equilibrium. If the table did not press up as much as the weight on it presses down, it would be broken. The foundations must meet the downward pressure of the building by an equal upward pressure, or motion and collapse will result. But action and reaction may be dynamic also, as when the earth attracts the sun and the sun attracts the earth; and in this case the law is no self-evident necessity. It is common to speak of this as a case of tension, and

to illustrate by a tense cable. If a person in one boat pulls at another boat, each boat moves towards the other, and action and reaction are equal. At any point whatever in the cable there is equal tension in both directions. But this illustration is of no use until it is shown that attraction takes place through a cable. There is no difficulty in conceiving that a magnet should attract iron without being attracted by it. The magnet causes in the iron a state which tends to translate itself into motion towards the magnet, but this in no way implies that the iron must cause a similar state in the magnet. Neither act implies the other. The same is true for attraction in general. The attraction of any one element does not imply the attraction of any other. This is all the more evident from the fact that many physicists have spoken very freely of repulsive elements which meet attraction with repulsion. It is, indeed, a grave misuse of language to speak of anything as reaction which is not directly elicited by the preceding action. Repulsion due to pressure, or to repulsive forces called into play by previous motion, is properly described as reaction, because it results from the previous action; but the attraction of one element upon another is in no sense a reaction from the attraction of the other upon it. This confusion of so many things under a common term is what makes this law such an inexhaustible mine of truth in the view of English physicists. That the law, in this wide sense, is based entirely upon induction needs no further proof.

The next law of motion which calls for consideration is that relation to the composition of motions. This law is implicit in Newton's second law of motion. If the abstractions of kinematics were realities, we might at once allow the parallelogram of motions to be a rational necessity. If the tendency to move in each of two directions is to be satisfied, it can only be as the motion is along the diagonal of

the parallelogram on the lines representing the tendencies and directions. But, in reality, it is not a question of compounding motions, but of finding the resultant of forces which tend to cause the motions; and this introduces new difficulties into the question. The law is sufficiently justified in practice to exclude any doubt of its validity in all molar motions. Its necessity, however, is quite another thing, and depends on certain assumptions which are far from self-evident. The chief one is that each force shall have its full and proper effect in a crowd as well as when acting alone. Thus if A and B both attract C, the law assumes that each shall have its proper influence without regard to the other. On this assumption the resultant must be represented by the diagonal of the parallelogram on A and B. But this is so far from necessary that it is antecedently improbable. It would seem as if the effect of a new impulse ought to depend on the previous state of the subject. This is the case in the only subject of which we have direct knowledge. The effect of a new thought or desire depends very largely on the character of the thoughts and desires already in the mind. The same thing affects us diversely according to our mood or preoccupation. It is, therefore, a surprise to find that the elements are never preoccupied, but are always open to any new impulse whatever. This is so strange, and from the stand-point of the mental life so paradoxical, that we can allow the law only as a fact, and only so far as it is justified by experience. It is possible that in the molecular realm, especially in chemistry and biology, the law may be modified.

Another assumption is commonly read into this law which does not belong in it. The law itself says nothing of the nature or origin of the forces, but views them all alike as moving forces. They may be qualitatively distinct otherwise; but as moving forces they all stand on the same plane,

and their effects are combined according to the parallelogram of motions. But it is generally further assumed that the forces themselves act in the same way, whether singly or in a crowd. The action of a given element is not affected by aggregation, but only by its own position in space. The same amount of matter, at the same distance from the earth, will attract with the same intensity whatever its form may be. But this also is no necessity of thought, and from the stand-point of human experience it is antecedently improbable. If such variation were allowed, it would, indeed, increase the difficulty of calculation indefinitely; but this proves nothing. As it is, we regard the action of a compound as the sum of the acts of the components, and we reach the total action by summing up the effects of the separate factors. If it were otherwise, we should have a problem immeasurably more complex than that of three bodies. In the latter case we have to find the positions of bodies from forces which depend on the positions which are to be found; but in the former case we should have the additional difficulty of not knowing even the law of the forces. The parallelogram of forces might still be valid, but it would be useless. The actual forces would depend upon the aggregation or velocity of the elements, and could be known only from their resultant. Nevertheless, the independent action of each element as assumed in mechanics is so far from a necessary truth that it is not even known to be true at all except in the case of gravity. In particular it has been suggested as a help to the mechanical theory of life that possibly the elements in the organism no longer work under this law, but under some other which expresses the idea of the organism. In that case the elements would owe their properties to the mode of aggregation. It is difficult to get any clear idea from this theory beyond the negative suggestion that the common assumption of the

independent action of each element may not be true. At all events, it is plain that if the common doctrine is correct, it cannot be viewed as a rational necessity, but only as a fact.

So much for mechanics from the realistic stand-point. Our own metaphysical doctrine changes all this, and we have now to say a word concerning mechanics on the idealistic view.

Theoretical mechanics is purely an abstract science, and as an abstraction would be perfectly valid for logic, if it had no significance for reality. The manipulation of the assumed data is quite independent of concrete facts. But when it comes to regarding these abstractions as realities, it is then in place to inquire into their true nature. Pursuing this inquiry, we find that neither matter nor force nor motion has any such existence as we have attributed to them. Mechanics, then, must be looked upon at best as only a science of phenomena, and a good part of it must be viewed as of the nature of a device for calculation. A great many problems in mathematics cannot be directly treated; and then we resort to various devices of substitution or transformation, whereby they are made amenable to our calculus. But these devices are no part of the fact; they are only our shifts for dealing with it. A large part of mechanics is of this sort. The compositions and decompositions of forces and motions, the analysis of motion into abstract laws, the breaking up of complex facts into simple ones, are mainly to be looked upon as devices of method, and not as some actual process in reality. They are purely relative to ourselves, as much so as the degrees of the circle or the meridians and parallels of the geographer.

And in so far as mechanics deals with the objective order,

it is only phenomenal. We must reduce the whole apparent world in space and time to phenomenal existence, and study its phenomenal laws, leaving the metaphysical question to philosophy. As a matter of fact, phenomena have laws. They come together, vary together, succeed one another according to rule. These laws are largely spatial and temporal, and admit of geometrical and numerical expression. Every such expression is valuable if it helps us to a knowledge of the order of phenomena, and especially if it gives us any practical control of them. These laws have to be learned from experience. Neither the laws of motion nor the so-called laws of force admit of *apriori* deduction, and all alike are valuable only for the practical control of phenomena to which they may help us. But in all of this we are dealing only with phenomena, and not with the essential dynamics of the system. The true efficient causality lies in a realm into which science as such has neither the call nor the power to penetrate.

Again, speech will always substantiate the constant phenomena of perception, and for obvious reasons. Without fixed conceptions thought would vanish. Unless the phenomenal world presented relatively fixed objects, we could do nothing with it. Hence, except upon occasion, the phenomena revealed in perception will be spoken of as things; and there is no objection, if we remember that this is only a convenient form of speech, as when we speak of the setting of the sun. In like manner the study of the phenomena of body may suggest that they result from more elementary phenomena; and there is no objection to substantiating these elementary phenomena under the name of molecules and atoms, if any practical advantage or convenience of representation be found to result. But such practical convenience must not mislead us into overlooking the purely formal character of these notions. The material

world is not compounded of atoms and their forces, but is rather a product of one infinite, omnipresent, eternal energy by which it is continually supported, and from which it incessantly proceeds.

But because this world shows a constant phenomenal order, and because this order admits of being to some extent expressed and construed by us under the forms of space and time and number, we may resume with practical confidence the language of daily life and of mechanical science, only guarding ourselves against mistaking the form of the world for an ontological reality, or for its ultimate causal ground.

Criticism, however, is in its full right when it reminds us that our confidence in concrete science must always be practical rather than speculative, and hence must grow shadowy when the doctrines are remote from any practical interest. The holding together of the experienced order is a condition of living at all; and faith in the order to that extent is secured by a psychological expectation which is too strong for any scepticism. But when it comes to transforming this expectation into a logical warrant, logic has to confess its failure. And as a compromise between the imperious practical necessity and the insight of the critical intellect, logic advises us to limit our speculative affirmations in the scientific field to a reasonable degree of extension to adjacent cases, or to remember their purely hypothetical character.

CHAPTER IV

NATURE

All the categories of reason manifest themselves, at least implicitly, even in the crude products of spontaneous thought. Space, time, matter, motion, and force seem to supply all the materials for objective thought and speculation. They are the factors into which, apparently, experience resolves itself upon analysis, and out of which experience must be built. But there is one demand of thought which these factors alone do not supply. In themselves they give no totality, no system, nothing complete and rounded off into an all-embracing whole, but only a heterogeneous collection of things and events. This demand for system and totality the mind has met by forming the notion of nature or the cosmos or the universe, the implicit aim being to pass from the discontinuous events and scattered existences of experience to a law-giving whole.

This nature Kant called an idea of the reason, and we have ourselves seen that it is primarily an ideal of reason rather than a fact of experience. Experience keeps us among details; the building these into a systematic whole is a special venture of the mind itself, in which it follows not so much the compulsion of the facts as the impulsion of its own rational law. Kant held the idea to be regulative only, and not objectively valid. To this view he was led partly by the logic of his system and partly by the heresy

of extra-mental realities. For one who has reached the insight that thought can never recognize anything which is not rooted in thought, the Kantian contention is antiquated in its traditional form. How we must think about things is the only question which can rationally be raised in any case. Hence, instead of wasting time in barren discussions concerning the relative or absolute validity of thought, we do well rather to inquire what thought really gives us when it becomes reflective and critical. The final utterances of thought admit of no real doubt, but only of verbal denial.

The end sought in the notion of nature is justified, and must in some way be reached. But the formal justification of a category by no means insures its right application. After we are sure that there is causation, the form under which we must think it remains an open question. So, after we are sure that there is a law-giving system underlying experience, the form under which we shall conceive it is a problem for further investigation. How we shall think of nature, then, is our next inquiry. The significance of the study arises from the fact that there is probably no other notion in the range of thought which contains so much bad logic and crude metaphysics, and which is at once the source and expression of so much confusion and error. To see this, one need only recall the traditional debates over the natural and the supernatural, and the various interesting functions ascribed to "Nature" by popular rhetoric and speculation. There is enough of this crude matter floating about to give a large measure of justification to Kant's claim. This nature of popular thought is more than relative; it is fictitious.

What, then, is nature? From our own metaphysical stand-point this question admits of a brief answer. Indeed, it has already been implicitly answered; and for the practised thinker nothing more is needed than to gather up into

concise and explicit statement the implications of the principles already established. But for the sake of the beginner and the weaker brother—and both of these are always with us—it seems pedagogically desirable, even at the expense of much repetition, to take a somewhat roundabout way. The popular view must be studied in its logical and psychological origin, if we would understand its plausibility, and also its inherent and incurable confusion. It must also be studied in its concrete forms and specifications if we would thoroughly understand it.

There are two conceptions of nature implicit in popular speculation which are rarely distinguished, and each of which becomes explicit upon occasion. One view identifies nature with physical nature, and the other identifies it with the system of law. In the former view man and spirit stand in antithesis to nature. With this view spontaneous thought generally begins, at least by the time it has attained to the early stages of self-conscious reflection. Then, as the unity of the world begins to appear in experience, and the reign of law manifests itself in the human realm, and the desire for one all-embracing system gives implicit direction to thought, nature expands beyond the physical realm and becomes identical with the universal system of law. In all of this the speculator is rarely intelligible to himself, but he is perfectly intelligible to the philosophic critic, who sees in this performance the unconscious working of unmastered logical principles.

But in popular thought and experience physical nature bulks so large as to be pre-eminently, if not exclusively, what we mean by nature. Most of our theorizing on the subject, also, rests on a physical basis. We shall do well, therefore, to study first this physical conception of nature, and afterwards advance, if need be, to the more abstract conception of nature as the system of law.

Nature as Matter and Force

As the untrained mind is naturally objective in its thinking, the things and bodies about us are taken for substantial realities as a matter of course; and they tend, in advance of reflection, to become the standard by which all reality must be measured, or to which it must conform. Spirits may be doubted, and, at best, are somewhat hypothetical, but things are undeniably there. And as these things by an easy generalization may be gathered under the one head, matter, and their activities may be ascribed to the one cause, force, matter and force come to be the supreme and basal realities of objective experience. Space and time, then, furnish the scene; matter furnishes the existence; and force, manifesting itself in motion, furnishes the causality. These five factors constitute nature, and from them nature is to be construed and comprehended. According to a popular and showy cosmic formula, cosmic processes consist of an integration of matter and concomitant dissipation of motion. Here space and time are implied; matter is expressed; and force, as the grammarians would say, is elegantly understood. And we are often impressively, or at least emphatically, told that all interpretation of nature must be in terms of these factors. Anything else would be unscientific, or something just as bad.

Here we have a confusion of a metaphysical proposition with a principle of inductive method. Our study of explanation in the *Theory of Thought and Knowledge* showed that our practical study of nature must mainly consist in looking for the laws of coexistence and sequence, and of combination and concomitant variation among phenomena, and that our valuable practical knowledge must very largely consist in a knowledge of these laws. Even on a phe-

nomenal theory of matter, space, and time, matter and motion must be the great categories of inductive study and practical understanding. Matter is the phenomenal subject without which thought and speech would be crippled; and space, time, and motion represent the prominent relations existing among material phenomena. In this methodological sense we accept and emphasize the importance of the categories of space and time, matter and motion, for the practical study and mastery of experience. But we cannot allow them to represent independent ontological facts. The universe has only a phenomenal existence; and its causality must be traced to the fundamental reality behind it. Nature, then, is phenomenon. Nature as matter and force is a fiction of crude thought, arising from the substantiation of physical phenomena, and the application to them of categories which find their true significance only in another field.

But of all this sense thought has no suspicion, and on the basis of the undoubted metaphysical reality of space, time, matter, motion, and force, it proceeds to build up a mechanical doctrine of nature. Nature is made into a mechanism of impersonal things and forces, and all its changes go on mechanically. At present, at least, it runs itself, and, on due consideration of the indestructibility of matter and the conservation of energy, it even becomes doubtful if nature has not always run itself. Of the phenomenality of nature, of course, there is not the slightest suspicion. This notion also deserves examination, as it is the perennial source of a great cloud of whimsies and divers conflicts of science and religion.

Nature as Mechanism

Nature, then, is a mechanism; and all natural phenomena are to be mechanically explained. This is agreed and in-

sisted upon. There has never been, however, the clearest conception of what mechanism is to mean. The notion itself has undergone various changes, all of which have left traces in the current view. Some have insisted that a purely mechanical theory must assume nothing but matter and motion under the conditions of space and time. Force is a dynamic idea, not a mechanical one. Hence it has been claimed that a strictly mechanical theory of things is found only in the Greek atomism, which, without appealing to moving forces or occult qualities of any kind, sought to construe the system from atoms and the void alone. Descartes went even further and rejected the Greek conception as not purely mechanical. This he did partly on the ground that the Greeks assumed the void as real, and partly because they posited weight as a property of the atoms. The reality of the void he denied as absurd, and the assumption of weight he viewed as a return to the dreary waste of occult qualities. For Descartes the essence of matter was extension, and for him the mechanical theory implied that all heterogeneity of quantity and quality in the material world can be explained as modifications of the one homogeneous property of extension and the one experienced fact of motion. Any theory which came short of this simplicity was in so far a departure from the mechanical view. Accordingly the dynamic conception of matter was for a long time resisted as not mechanical. Matter, it was held, can act only by impact; and any other theory was rejected as a return to occult qualities. In this view that alone is a mechanical explanation which refers a phenomenon to a combination of particles whose essence is extension, and which act only by impact. Extension, solidity, motion, and impact are viewed as self-sufficient ideas, and as the only outfit demanded by the mechanical philosophy. Hence, in the Cartesian philosophy, all dynamic theories of matter are op-

posed to mechanism; and the antithesis of mechanism is not organism, but dynamism.

This conception of mechanism arose partly from the facts of sense experience and partly from the analogies of the machines of our own invention. The bodies about us are apparently in the passive voice, and move only as they are moved. Our machines also generate no force, but only transmit force imparted from without. With this conception of mechanism we are forced to affirm a prime mover in any case, and, if material phenomena refuse to be explained as the result of impact, we have to assume an extra-material power as the ever-present source of the energies of nature.

But since the time of Newton the mechanical theory has been transformed by importing causation into the mechanism. Nature is not a mechanism in the sense of transmitting or modifying forces imparted from without, but rather in the sense that all phenomena are produced by resident forces according to mechanical laws. And yet traces are not lacking of the feeling that a pure mechanism ought not to appeal to other notions than those mentioned. Still, the holders of this view make the freest use of the notion of moving forces; and it is chiefly in occasional attempts to explain these forces as the result of pressure or of impact that the inner unrest appears. But the moving forces assumed are made as colorless as possible; and thus the mechanical theory becomes about identical with theoretical mechanics. In this science we have the three factors of matter, force, and motion to determine their mutual relations. Here, too, all qualitative differences are ignored. Matter is simply a rigid mass or an aggregate of rigid atoms. Force is viewed simply as causing or retarding motion. All is quantity in the theory; and quality is dealt with only as it can be transformed into quantity.

The system thus reached differs from the corpuscular theory only in the conception of moving forces; but these are so colorless as not to change the appearance of the whole. Both views are equally monotonous. All that is possible in either is a redistribution of matter according to the laws of motion. This is produced in one case by the atoms knocking against one another; in the other case the atoms pull or push one another; but in both cases the process is a perfect monotone. Accordingly, a mechanical system is often said to be one in which there is nothing but a redistribution of matter and motion; and the claim that the system is mechanical is understood to mean that everything can be explained in terms of matter and motion; and matter is conceived as essentially the same in all its combinations. This is the current popular conception of the mechanical theory.

This also is an ontological doctrine. It claims to set forth not merely a practical interpretation of physical phenomena, but also the substantial things and forces by which those phenomena are produced. Its ontological untenability is already familiar to us; and equally familiar is its logical inadequacy, in the form given, to the work assigned it. As soon as we think concretely and adequately, it becomes plain that nothing whatever can be explained by mechanism, atomic or otherwise, which is not assumed in principle in the mechanism. It is only the imposture and deceit of words, or the delusive unities and simplifications of speech, which prevent us from seeing this. The material mechanism explains the physical facts only because we build the mechanism to contain the facts, and thus it becomes only another aspect of the facts themselves.

This aspect of all mechanical explanation has been dwelt upon at length in the *Theory of Thought and Knowledge;* but the fallacy of the universal, which is in play here, is

so subtle and pervasive that it seems desirable to show once more the emptiness of all such explanation, when it assumes to be ontological and final. The persuasion that matter and force already explain much and are daily explaining more, so that no one can really set any bounds to their capabilities, is one which goeth not readily out, not even when its fallacious and illusory character is brought to light. No single anointing will open the eyes which are blind concerning this matter.

Now, returning to our atoms, which for the present we allow to be real things in space, it is plain, first of all, that we can do nothing with them unless we regard them as dynamic. Bare lumps can only lie around. They would not even explain heaps, unless we assumed a mover outside of them to give the original shove and direction, or shoves and directions. We must then posit moving forces within. How to do this at all is a problem of notorious metaphysical difficulty; and how to do it so as to make the forces adequate to their task is a problem of exceeding logical difficulty. For unless these forces are under some structural law they will explain only heaps again. Simple pulling and pushing in a straight line, as in the case of linear forces, makes no provision for organization, but only for amorphous masses. Just as little do they provide for the qualitative changes arising in the cosmic process. A linear force like gravity might explain aggregation, but it contains no account of the selective and qualitative action of affinity, no account of the building forces of crystallization, no account of the infinitely complex products of organization.

Assuming, then, the existence of our mechanical system, we have a double order of facts, one of spatial change, combination and separation in space, and one of a metaphysical and dynamic nature. The former is a visible, or at least

picturable, change, among things; the latter is an invisible and unpicturable change in things. The former depends on the latter. All spatial changes among things must be viewed as translations into phenomenal form of dynamic relations in things. These are the real ground of whatever takes place under the spatial form. Nothing whatever which takes place in the spatial order explains itself, or anything else, until it is taken as the exponent of a hidden dynamic order. If to a collection of bricks we should add another brick, no one could find in that fact the slightest ground for any qualitative change in the collection. We might conceivably pile them in various shapes, or arrange them at the angles of different geometrical figures, but we could find in all this no reason for varying behavior on the part of the bricks. If to a given chemical molecule we should add another chemical element, they must remain as mutually indifferent as the bricks, unless we assume a system of dynamic relations within the elements themselves which determines their interaction and the form of their manifestation.

This invisible dynamic system is largely overlooked by superficial thought; and its complexity is overlooked altogether. Such thought has the atoms and the void for its principal data, and it can easily conceive the atoms as variously grouped within this void. The spatial imagination serves for this insight; and the demand for causation is met by a simple reference to force in general. If one asks how these peculiar groupings are accounted for and how they themselves account for anything, he must be content to wait long for an answer.

Two points are to be borne in mind. First, the dependence of the spatial system on an unpicturable dynamic system. We may resolve to locate the forces in the elements, but it is strictly impossible for us to represent our meaning

in any way whatever. Spatial combination we can picture. Volitional causality we experience. But here is a dynamism which is less than the latter and more than the former, and we have absolutely no data of experience by which to represent such a notion. We have indeed located the forces in the spatial elements, but they are not in them so as to be objects of any possible intuition. How does affinity or gravity look? Does a necessity have shape? or is a dynamic law something which might be thrown on a screen, if the light were strong enough? If by mechanism we understand the spatial system, its ideas are clear, but it is limited to phenomena and explains nothing. If we extend mechanism to include the dynamics of the system, we are no longer dealing with clear ideas, but rather with the abstract categories of cause and ground, and are dealing with these in such a way as to make impossible any concrete conception of our meaning, and indeed in such a way as to contradict the categories themselves.

The second point to be borne in mind is that if we would make our mechanism adequate we must make it as complex as the facts themselves. This point becomes self-evident as soon as we get a logical grasp of the problem. In all referring of effects to causes, in a mechanical scheme, we are bound to determine the thought of the causes by the effects. The causes we infer or postulate must be the causes of just the effects in question, no more, no less, and no other. That is, we carry the effects in principle into the causes, and in such a way that whoever should think the causes exhaustively would find that they contain, or imply and necessitate, the effects. If the causes do not imply the effects, the effects are not provided for. If they do imply them, then the effects are explained by being smuggled into the data of the explanation. This, as we have seen in the *Theory of Thought and Knowledge*, is the deadlock into which every mechani-

cal explanation inevitably falls when it assumes to be ontological and final.

The blindness of popular thought at this point is due to the fallacy of the universal. We construct our mechanism with very simple factors—space, time, matter, motion, and force. These show no complexity, and at the same time they seem to be all-embracing. What is there, at least in the outer world, which does not come under some of these categories? and as mechanics is the science of these factors, what is there which mechanics does not explain? But this is an illusive simplicity. These categories apply to the concrete facts without implying any of them. The concrete fact is not space, time, and motion in general, but an indefinite multitude of particular forms, groupings, and movements in particular temporal relations. Neither is the concrete fact matter and force. These are only class terms of which the reality in this scheme is a great multitude of particular elements, each of complex nature and engaged in a highly complex interaction with every other. The elements must be such as to involve to the minutest detail all they will ever do. If we ask what the "such" is which the elements must be in order to do the work, the answer must be that no inspection of the elements as existing in space will ever reveal it. It is an unpicturable, dynamic such. And the such itself is manifold. It is not such, but an indefinite number of suches, involving not merely the general dynamic relations of the elements, but all the myriad structural and organic laws which run through the world of things. How this can be, indeed, passes all picturing and even all understanding; but nevertheless we know that it is so by hypothesis, and we know that it must be so in the same satisfactory way—by hypothesis.

Space, time, matter, motion, and force may indeed be said to be the elementary factors out of which nature is built;

but they are the component factors in the same sense in which the letters of the alphabet are the components of literature. Take away the letters and literature would disappear, as lacking the instruments of expression. And yet there is a great deal more in literature than the alphabet, or even than the dictionary. The collocations of letters into words, the information of words with meanings and their grouping into discourse, must also be taken into account. In like manner in the mechanical system we must consider not merely the simple abstract ideas of space, time, matter, motion, and force, but we must take account also of the concrete forms, relations, laws, and products which exist or emerge in the process. But by this time the mechanism has become as complex as the facts themselves. As an explanation of the facts, it is a tautology. If the facts needed explanation before we built the mechanism, they need it equally after the building, for the mechanism only repeats the facts.

Thus logic shows the tautologous character of all mechanical explanation of a metaphysical type. Mechanism can make no new departures; it can only unfold its own implications. Our previous study has also shown the untenability of the metaphysics on which this mechanical theory rests. Nature in the sense of a system of matter and force, moving and acting in space and time, and forming a substantial mechanism, is only a phantom of sense thinking which arises from hypostasizing the phenomena of objective experience. With this result the notion of mechanism begins to be wavering and uncertain. In any case the notion of self-running material machinery must be emptied out of it, and mechanism must be restricted to a phenomenal plane and significance. The term, too, is somewhat misleading because of the company it has kept, and because of its physical, if not materialistic, connotation.

Mechanism has a perfectly clear meaning only for the composition or decomposition of motions and masses. When it goes beyond this to abstract mechanics it is infected with the uncertainties of the metaphysics of dynamics, and even then it has no clear meaning except as applied to bodies separated in space and to quantities which can be summed up in time. From this point on all is dark. When we come to organization we may posit subtle tendencies, or mysterious affinities, or latent organizing powers; but of all these no mechanical representation whatever is possible. We shall do well, therefore, to reserve the term mechanism for the spatial and temporal composition or decomposition of motions, masses, and quantities, and to replace it in other applications by the more general and abstract term law. This will include mechanism in its proper field, and will also embrace the larger field of life and man to which mechanism does not manifestly apply.

Nature as the Order of Law

If we should ask for a definition of the natural, the first answer would almost certainly limit it to the physical field. But a little reflection would soon show the narrowness of this view. Mental and social movements, as well as physical changes, arise naturally. Life, mind, society, all human activity and progress, show an order of uniformity; and all changes in accordance with that order are called natural. The result of these considerations is to make the natural coextensive with law, and thus finally nature comes to be identified with the order of law. This is that second conception of nature which, we have said, is implied in popular speculation.

Of course, in uncritical thought this nature is metaphysically conceived. Nature is not merely an order of phe-

nomena, but a cause or system of causes. There is here a failure to distinguish the phenomenal and the causal, and also a confusion of the formal necessity of affirming causality with a particular conception of its form and location. The untenability of this metaphysics needs no further exposition.

But in this conception of nature as the order of law there is an important truth which we must disengage from its crude metaphysics. It is this truth which constitutes the significance of the mechanical theory of nature, and the gist of what we call scientific method. But this truth must be sought in logic and epistemology and not in sense metaphysics. We proceed to the exposition.

Logic shows that experience arises only as the categories of thought are applied to the raw material of the sensibility; and that a mastery of experience is possible only as phenomena are subject to fixed laws. The mind, then, in its effort to rationalize, comprehend, and control experience, must reflect upon the categories of its procedure and must look for the laws of phenomena. Undigested experience gives us phenomena in very rude and crude masses, and the mind attains to any mastery of this experience only as it subordinates these masses to law, and especially as it analyzes them into their simplest elements, and discovers the elementary laws which govern their coexistence and combination. When this is done we get a practical mastery of experience and some proximate insight also. We see how things and events hang together in an order of law, how one state of things grows out of another state of things and produces a new state of things. With this knowledge we get a basis for practical expectation and a means of controlling phenomena to some extent.

This mode of procedure, we have said, is the gist of scientific method; and the great bulk of our valuable knowl-

edge of the world and man is obtained in this way. And the study of things by this method can be carried on on a purely inductive basis. Its postulate is an order of law, and its aim is to connect things and events with one another in this order. It does not pretend to deduce the order, nor to tell how it is possible or is produced. It accepts the order as a fact, and seeks to find how things and events hang together within the order.

Now such an order, though no metaphysical necessity, is a necessary postulate of human thought, and some knowledge of this order is necessary in order to live at all. Study in any field proceeds on this basis. The very notion of system implies it. The study of life, of mind, of society, of history, assumes that there are elementary laws by which the whole is to be understood. Our efforts at education, at mutual influence, at self-government, all rest on the notion of fixed laws through which alone our aims can be realized. It is plain, therefore, that, whatever our metaphysics, the laws which obtain among phenomena are a most important object of study. For all speculators alike, practical wisdom must centre here.

If, now, there were any advantage in it, we might call this order of law mechanism. This has been done, and the universality of mechanism has been proclaimed. We might, without utter linguistic impropriety, speak of the mental mechanism, the social mechanism, the mechanism of feelings or ideas, etc. These phrases may be allowed upon occasion, but the associated connotations of the terms are such as to make them misleading except for the initiated. We had better, therefore, speak of the realm of law rather than of the realm of mechanism.

But the notion of nature in popular thought is so rooted in metaphysics that special effort is needed to make the phenomenality of nature even intelligible. When we speak

of events coming about in an order of law, it is easy to conclude that the law explains them as being their efficient cause. But logic has taught us to distinguish between inductive and productive causality. The former expresses only phenomenal conditions, and has nothing to do with efficiency. The question, how things are brought about, is itself ambiguous. It may mean, How are phenomena connected in an order of discoverable law? and it may mean, What are the causes which produce them? The former question belongs to inductive science, and may be answered on a purely experiential basis. The latter question runs into metaphysics, and must be tested by metaphysical canons. The two questions are never sufficiently distinguished by popular scientific thought, which oscillates confusedly between them.

The non-existence of any ontological mechanism is already an article of metaphysical faith with us. Our previous study has convinced us of the phenomenality of all that appears in space or that exists in space relations. It has also shown that impersonal being in general can be viewed only as an unwarranted hypostasis of phenomena. Nature as an order of law, then, has only phenomenal existence; and the explanations within the order have only phenomenal application. They have no causality in them, and they do not penetrate to the seat of power.

And these explanations remain on the surface in any case. They commonly consist in linking event with event in an order of law, but there is rarely any insight into the antecedent which shows the consequent to be a necessary implication. Events follow, indeed, in a certain order, but, for all we can see, any other order whatever is just as possible. We learn the order by observation; and after we have learned it, when the antecedents are given, we predict the consequents, simply as an opaque expectation. It is

only in the abstractions of pure kinematics and pure dynamics that we can trace the antecedent into the consequent, or exhibit the consequent as the resultant of the antecedents. But as soon as we come to concrete reality this insight fails entirely. We jolt and bump along from one event to another with not the slightest reason for expecting one event rather than any other, except the fact that the expected event is the kind which hitherto has happened in our experience. We expect wheat from wheat and barley from barley; and we know the practical conditions of raising wheat and barley; but we know absolutely nothing of the causality at work, and we are totally unable to connect the successive steps of the process by any causal or deductive bond in the phenomena themselves.

When we come to life, mind, and society, scientific method itself begins to lose its objectivity and sinks towards a relative validity. In the inorganic realm composition is the great category; and here explanation takes on the form of analysis and synthesis. The whole is understood through its parts. But this is impossible with organic and intellectual wholes. Here the parts exist only through the whole, and, instead of being the factors out of which the whole is built, they are simply particular aspects of the whole which are separated by abstraction for the sake of logical convenience. This is especially the case in psychology. The faculties are not the factors out of which the mind is built up. The sensations are not atoms of feeling out of which mental molecules and masses are constructed. These mechanical analogies are misleading and illusory. Our analysis of the mind gives not components but aspects, distinctions rather than divisions. And the mind is not to be understood through these aspects, but, conversely, they are to be understood through the mind. In this realm our analysis and synthesis are relative to

ourselves, and represent logical devices rather than the fact.

This field of experienced law is the field of inductive science. Its practical importance cannot be overestimated, but its theoretical significance is easily misunderstood. Crude thought turns it into ontology, finds in it the order of efficient causation, and makes everything hard and fast by importing the notion of necessity into it. For us this is an "overcome stand-point." The only definition of nature which criticism can allow is, the sum-total and system of phenomena which are subject to law. The definition of physical nature is, the sum-total of spatial phenomena and their laws. This nature is throughout effect, and contains no causation and no necessity in it. To use the scholastic phrase, it is *natura naturata*. Nature as cause may be simply a name for the cause of natural phenomena. In that case the name has no connotation and simply denotes a problem. But when nature as cause is posited as some blind agent or agents, it represents only bad metaphysics. This is *natura naturans*, and is simply an idol of the sense tribe or of the metaphysical den.

But we find, however, that laws obtain among phenomena, and that by a study of them we can get a very considerable practical mastery over phenomena. These give us no theoretical insight into the causal ground and connections of things. They remain on the surface, and are to be studied purely for their practical significance, or for what they may help us to. Any scientific or other generalization is to be welcomed which will give us a more convenient expression of the natural order, or a greater mastery of it, but no metaphysical insight is to be found in this field.

Nature as Continuous

The habit of looking upon nature as a system of necessary causality easily leads to the conception that all phenomena are to be explained within the system itself. There must be no interferences or irruptions from without, under penalty of the speculator's displeasure. This conviction expresses itself in the law of continuity.

This law is another principle of superficial reflection which contains some truth and some error, but still more confusion. It is, indeed, rooted in a genuine rational demand, but the meaning is far from clear. Continuity of some kind there must be, but what it is and where it is remain a problem.

The law of continuity is one which has had great prominence in the history of speculation. This law was first formulated by Leibnitz, and was at first confined to motion only. Afterwards it was extended to every department of thought and experience. The evolutionists in particular have made it one of their first principles and the most fundamental law of progress. In this wide sense the law has no fixed and scarcely any assignable meaning. As used by some speculators, it seems to exclude all antitheses whatever; and Spencer's attempt to deduce all heterogeneity from the homogeneous may be viewed as an attempt to give the law this universal significance. The Leibnitzians, also, were fond of making the increments of variation infinitesimal in all directions, so that all widely separated groups are joined by missing links or are produced by infinitesimal variations. On the basis of this conception, Leibnitz ventured to affirm something like the development of species, and the indistinguishability of all realms at their points of junction. He also ruled out all absolute oppo-

sitions like rest and motion, and all incommensurable realities as space and time. On the same ground he denied all beginning in time and all bounds in space. Rest is insensible motion. Space and time are ideas; and creation means only dependence. This doctrine of continuity in general has had great favor with flighty and impatient speculators from its first announcement, because it is at once so effective and so cheap. If missing links are sought for and fail to be found, it is easy to say that the law of continuity proves that they must have existed even if they cannot be found. The distinction between the organic and the inorganic is easily removed by the same method. In psychology, also, the empiricist has no difficulty in showing that sensation is the only fact, because to allow anything different would be to break continuity. But while one speculator deduces life from the lifeless by the principle of continuity, another denies the possibility on the same ground. Continuity, he urges, demands that life shall come from life, and forbids any other view. Materialism likewise is affirmed and denied in the name of continuity. Unfortunately these speculators have never bethought themselves to give a general demonstration of this law, nor even to define the various senses in which it is used. Sometimes it is simply a denial of creation and the supernatural; sometimes it means that nature never makes a leap; sometimes it means that all phenomena are but phases of a common process, and that from any fact whatever in the system we can pass to any other, however different, by simple modifications of this process. In short, it means anything which happens to be desirable. These flighty imaginings can be escaped only as we apply the law to some concrete matter and fix its significance and value for that matter.

What is it, then, in the case of nature which is continuous? Is it natural things in their existence, or natural

causality, or nature as phenomenon? The suspicion begins to dawn upon us that nature is not continuous in any of these senses, and that the continuity of nature is to be found in the continuous validity of the system of law and in the continuity of the thought of which nature is the flowing expression.

That nature is continuous in its existence is a metaphysical proposition. It might mean that nature itself is a continuous substantial somewhat, or that the material elements are continuous in their existence, and suffer no increase or diminution of their number. Both propositions are already condemned. The necessary dependence of the finite on the fundamental reality reduces it to contingent existence, and leaves us entirely unable to say how, or when, or in what order finite things shall begin, or how long they shall continue, or when, or in what order, they shall cease to be. A metaphysical doctrine with so many riders as this can never be put forward as a first principle. In addition, metaphysics reduces all impersonal existence to a flowing form of the activity of the fundamental reality. The only metaphysical continuity in the case is the continuity of the infinite being in which nature has its root.

But natural causality is continuous. To question this would be fatal to all science. But here again we have confusion. Some causality must be continuous, without doubt; the cessation of all causality would be the vanishing of nature. If natural causality means the causality which supports nature, it is continuous, not indeed as a necessity, but as a matter of fact. How long it shall remain continuous, however, is unknown to all but the uncritical dogmatist, and he simply mistakes the monotony of his thinking for a law of existence. If by natural causality we mean the causality of nature, considered as an impersonal agent or system of agents, we have to say that there is no such thing.

Again, what the uncritical speculator really needs here is not a metaphysical doctrine about natural causality, but rather an inductive postulate of the continuity of natural law. As long as the order of law holds we may hope to construe experience. If this order should fail us, all hope of dealing with experience would vanish. But no metaphysical principle whatever can assure us of this continuity. There is nothing in the conception of impersonal causality to assure us that it is shut up to a uniform manifestation. The continuity of law, therefore, is a pure postulate which must either be referred to an abiding purpose in the cosmic intelligence, or else be accepted out of hand as an opaque fact.

The continuity of nature as phenomenon means the same thing, the continuity of phenomenal laws. In the strictest sense a moving world has no continuity in itself, but only for the observing or producing mind. Apart from this mind, nature, supposing it to exist at all, would be a mirage of vanishing phantoms, each and all perishing in the attempt to be born. But granting the observer and the phenomenal world, the only continuity possible would be the continuous succession of phenomena according to the same laws. The new phenomena as events would be other than the old, however similar they might be, as a new day is another day notwithstanding its logical equivalence to old days. But all the phenomena, new and old alike, would be comprehended in the same scheme of law and relation; and this fact constitutes the unity and continuity of the system. From the phenomenal stand-point nature has no other continuity.

Possibly we may still think that there is a deeper continuity, in that the antecedents condition and explain the consequents. Causal break and irruption are thus excluded, and we find our way from antecedent to consequent with-

out logical jolt or jar. But here again the thought is ambiguous, and is untenable in both its meanings. We have just pointed out the impossibility of tracing, either phenomenally or metaphysically, the antecedent into the consequent. We see an order of succession, but the inner connection eludes us. In passing from one phenomenon to another, thought moves along no continuously welded line of logic, but rather by a corduroy road with all the accompaniments of bumping and jolting. Except in a very general sense, nature, as we know it, abounds in discontinuities. This has to be admitted even by the believer in an ontological mechanism as the reality of nature. For, as we saw, he must recognize a double aspect to his system, a spatial and a dynamic. And the spatial is but the translation into phenomenal form of the dynamic, and has no continuity in itself. The movements of a thing may sometimes be the continuations or resultants of previous movements, but more often they are the expression of invisible dynamic changes. A kinematic system would be perpetually at fault in its conclusions, because the motions of the system have their roots not in previous movements, but in an invisible dynamism. Thus the continuity disappears from the phenomenal, where we might get at it, and takes refuge in metaphysical theory.

The only inductive continuity we can find or allow is one of phenomenal law. And this law produces nothing and really prescribes nothing. It merely states a uniformity of the phenomenal order. It erects no barrier of necessity against any one. The order of law is plastic, and its continuity does not consist in a rigid identity and monotony of its factors from everlasting to everlasting, but in a subordination of all factors, new and old alike, to the same laws. For every believer in freedom there are mental states or acts which cannot be deduced from the antece-

dent states. These are pure self-determinations which can be understood in their purpose, but cannot be explained in their origin. By their very nature they lie beyond scientific explanation, yet when they have arisen they then become subject to the fundamental laws of mental action. At the basis of the mental life, also, we meet with elements which cannot be deduced from the antecedent state of mind. These are our sensations, and are contributed or excited from without. But after they have been aroused, they then combine according to certain laws inherent in the nature of the mind. Hence the integrity of the mental mechanism does not consist in a self-enclosed continuity of mental states, but in the identity of those laws which determine the combination and succession of mental states, whether arising from interaction with the outer world or from the pure self-determinations of the mind. The same must be said of the cosmical mechanism. Here too, for every believer in freedom, there is much which cannot be explained as the result of the antecedent state of the system. Human thought and purpose have realized themselves in the physical world, and have produced effects which the system, left to itself, would never have reached. A great multitude of forms and collocations of matter can be traced back to human volition guided by purpose; and beyond that they have no representation whatever. These interventions, however, have violated no laws of nature. They arise from the introduction of a new antecedent, and the resultant varies accordingly. And the effect produced enters at once into the great web of law, and is combined with other effects according to a common scheme. Hence the integrity of the cosmic mechanism, as in the case of the mental mechanism, does not consist in a self-enclosed movement, but in the subjection of all its factors to the same general laws. The conception of the cosmic mechanism as incapable of

taking up new factors or new impulses, and subjecting them to a common order of law, is borrowed entirely from our experience with the coarsest of human inventions. The actual cosmic mechanism is able to receive the greatest variety of impulses from without, and to combine them with the part according to fixed laws. Only in this way can it be adapted to the use of our intelligence at all.

We conclude, then, once more that the continuity of nature means simply the continuity of phenomenal law, and we see that this continuity in no way conflicts with the complete pliability of the system to free intelligence, which may found it or be in interaction with it. The laws of the system are no independent necessities by which the action of the fundamental reality is bound; they are rather and only the rules according to which that reality proceeds. Neither are they anything which opposes a rigid bar to finite freedom; they are rather the conditions of any effective exercise of freedom.

Thus we set aside the error which frequently appears in popular speculation, the fancy, namely, that the actual system of law shuts everything up to a rigid fixity which can be modified only by irruption and violence. Unless appearances are very deceiving, we live under a system of law, and we find that system within certain limits pliable to our purposes and serving our aims. The system of law is the one thing which founds our control of nature, and by means of it we contrive to bring a great many things to pass which the system of law, left to itself, would never accomplish. The multitude of machines of human invention owe all their value to the laws of nature, but those laws alone would never have produced one of them.

The same considerations apply to the ultimatum often proposed by closet speculators, either absolute continuity or no science. For science as absolute system, comprehending

all things in a spatial and temporal order, and rigidly deducing every consequent from its antecedents, thus binding all things together by an "iron chain of necessity," etc., the assumption in question may well be a "postulate," but whether we are to grant the postulate remains for decision. There is something humorous in supposing a thing real because it is postulated. Such intimidations are formidable only in the closet. A set of sprites cognizant of physical phenomena, but not of human personality, might set themselves to study the physics of bodily movement. They might discover a great many uniformities in which all might agree; but if they should proceed to lay it down as an absolute postulate that every physical movement must be rigorously deduced from an antecedent movement, and especially that no extra-physical influence of a volitional nature was to be allowed, under penalty of exploding science, we should think that they had got hold of the writings of some of our romantic continuity theorists and dealers in absolute science.

But whatever freedom we allow our hypothetical sprites, it is high time we saw through these fictions of abstract theory. Absolute continuity may be a postulate of absolute science, but it is no postulate of the only science we have, and the only one worth having. If we allow that human wills, or other wills, are playing into nature for its modification, there is still a great realm of discoverable phenomenal uniformity which is the fruitful field of practical science. This remains, whatever our theory of causation and metaphysical connection. Even if we suppose that it is freedom which acts through the law, the law remains, and the knowledge of it is as valuable as ever. Freedom in nature cancels no law of physics. Freedom in willing cancels no law of mind. The claim that the realm of law would go if we admitted that our volition has any causal efficiency,

without or within, is not speech, but interjectional ejaculation. It is a product of that superficial closet speculation which has been so prolific of verbal intimidations.

Evolution

The popular notion of nature, we have said again and again, is a confused compound of phenomenal law, crude metaphysics, and misunderstood epistemological postulates. This confusion finds further illustration in the current doctrine of evolution. The factitious importance which this doctrine has acquired for speculators of the hearsay and of the physiological type warrants us in continuing to trace the familiar confusion.

Evolution may be either a cosmic formula or a biological doctrine. For the present we take it in the former sense.

As a cosmic formula evolution may have two distinct meanings. It may be a description of the genesis and history of the facts to which it is applied, and it may be such a description, plus a theory of their causes. In other words, evolution may be a description of the order of phenomenal origin and development, and it may be a theory of the metaphysical causes which underlie that development. These two conceptions are seldom distinguished; and it is their confusion, or conglomeration, which makes evolution so immensely significant, on the one hand, and such a bugbear on the other.

The formula of evolution as a description of the phenomenal order is familiar to every reader. The simplest and lowest forms of existence preceded the higher and more complex forms. Nothing begins ready-made. The present grows out of the past, the complex out of the simple, the high out of the low, the heterogeneous out of the homogeneous. In the inorganic world, if we should trace its his-

tory backward, we should find simpler and simpler physical conditions, until we came to some simple state of dispersed matter—say, a nebulous cloud. In the organic world, if we should trace living forms backward along genealogical lines, we should find those lines converging towards a common point of radiation. The forms of life would grow simpler, until in some very simple form or forms we should find the common starting-point from which the complex forms of to-day have been developed. The same order is to be observed in the development of mind, society, civilization, and institutions in general.

Now evolution in this sense is simply a description of an order of development, a statement of what, granting the theory, an observer might have seen if he had been able to inspect the cosmic movement from its simplest stages until now. It is a statement of method and is silent about causation; and the method itself is compatible with any kind of causation. One might hold to this phenomenal order and be an agnostic, or a positivist, or an idealist, or a theologian, as to the causation.

This conception of the phenomenal history of the world as showing such a continuous progress from the simple to the complex, from the low to the high, we may call the doctrine of evolution in its scientific sense. It lies within the field of science, and is open to scientific proof or disproof. Whenever the doctrine transcends this field of phenomenal description, and claims to give a theory of the productive causes, it then becomes metaphysics, and must be handed over to philosophical criticism for adjudication.

Evolution, then, in the scientific sense, is neither a controlling law nor a producing cause, but simply a description of a phenomenal order. And it is plain that there might be entire unanimity concerning evolution in this sense along with complete disharmony in its metaphysical interpreta-

tion. In such cases we have at bottom, not a scientific difference, but a battle of philosophies. The theorists agree on the facts, but interpret them by different schemes of metaphysics. This is the reason why some thinkers find in evolution a veritable aid to faith, while others see in it nothing but atheism. And the latter class are not entirely without excuse, owing to the failure to keep the scientific and the metaphysical questions apart, and especially owing to the bad metaphysics by which the facts have commonly been interpreted.

This metaphysics has commonly been of the mechanical and materialistic type, and almost invariably it has maintained a doctrine of necessity. Nature has been erected into a self-contained and self-sufficient system; and natural laws have been viewed as self-executing necessities. Under the influence of these crude notions evolution has been declared to maintain natural against supernatural causation, and continuity and uniformity against break and irruption. This antithesis has become a standing part of the popular discussion.

It is worth noting, also, that much of the current argument ill comports with the underlying philosophy. It is supposed that natural causation somehow secures phenomenal continuity and progress, and, conversely, that such continuity is especially favorable to the belief in natural causation. But there is absolutely no logical connection between natural causation, in the sense of material or physical or necessary causation, and the law of evolution, in the sense of gradual progress from the simple to the complex. Natural causation, in the sense mentioned, contains no provision whatever for phenomenal uniformity or progress. For all we can say, such causation might have a purely kaleidoscopic effect, and might perpetually cancel its own products. The continuity of physical causes and forces would be compati-

ble with the most chaotic sequences of phenomena, and the system might advance by perpetual explosion and catastrophe. If the actual system does not thus proceed, it is not because it is natural, but because it is confined by its laws and the relation of its parts to orderly and progressive movement.

And, on the other hand, if we assume that nature is a self-enclosed, self-executing mechanical order, what significance for the evolution argument is there in the presence or absence of missing links, or in the fact of progress by slow gradation? This conception of nature does, indeed, imply that every product must be the result of its antecedents, but it implies no given order or measure of likeness. In a system assumed to be self-executing the present grows out of the past as a matter of definition. Missing links might modify our conception of the order of procedure, but they would not affect our general view of causation. Sometimes the speculators have a suspicion of this fact, and point out that the absence of missing links, and even the fact of progress, are no necessary part of the evolution doctrine. The great thing is to maintain the continuity of natural causation, whatever the breaks and faults in the phenomenal order. Evolution, it is said, permits us to recognize any number of phenomenal fractures, if only we reject all interference with natural causation. The work must be natural, and must be carried on by "resident forces," if it is to be true evolutionary doctrine. But by this time the speculator has unwittingly changed his position without forsaking the old one. If the inquirer asks for the ground of progress, he is referred to evolution. If he should express surprise that evolution must be progressive, he is told that he is mistaken. Evolution implies neither progress nor regress, but only continuity. If the inquirer should find it still more surprising that there should actually be order and progress when

evolution is thus undetermined in its nature, the speculator will probably refer him back to evolution again; for is not evolution a change from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity through continuous differentiations and integrations? Thus with one barrel or the other the popular evolutionist is pretty sure to bring down the game. For the critic, however, who is not so easily intimidated, the two questions remain in plain sight: First, does evolution necessarily mean qualitative progress? If so, a necessarily progressive universe is a highly interesting subject for reflection, and readily lends itself to teleological interpretations. Secondly, does evolution mean only causal continuity; and is it equally compatible with either progress or regress? If so, how is the actual progress to be explained?

Something of an opposite confusion is beginning to creep into the thought of evolutionists of the theistic type. They bring forward the familiar arguments from gill-slits and that sort of thing, and point out that it is a mockery of our intelligence to see in these anything but a proof of genetic connection. But when they introduce God as the cause of the successive members of the evolving series, the series seems not to have in it anything sufficiently independent and abiding to give the argument a footing. In a phenomenal system nothing abides, but the order is incessantly reproduced; and if similar factors appear along the line, the later appearances are in no way due to the earlier ones, but to the law of the whole. If there were a tendency to gill-slits ensconced somewhere in nature, we might refer the later mislocated slits to it; but when the infinite is the cause of the members of the series, it would seem that, whatever mockery of our intelligence it might involve, we must, after all, refer them to the Creator, who, for reasons known only to himself, has seen fit to produce them. The

wicked are not the only persons who stand in slippery places.

But all this is something of an aside, and has its justification only as illustrating the confusion of popular speculation.

Evolution as a theory of causation is simply a piece of bad metaphysics produced by bad logic. Logic shows that in a mechanical or necessary scheme of any kind we can reach neither the one from the many nor the many from the one, neither the high from the low nor the low from the high, neither the definite from the indefinite nor the indefinite from the definite. If we seem to do so we merely fall a prey to the fallacy of the universal and mistake the simplifications of logical manipulation for the order of concrete fact. If there be a real progress from the simple to the complex, there must be a free intelligence as its author. If there be no such free intelligence, there is no progress, but only an unintelligible passage from potentiality to actuality. This in reality and for clear thought. Of course all things are possible to a cloudy intelligence; having no clear ideas, it can pass from everything to nothing and from nothing to everything with admirable facility. A vocabulary supplies all its needs.

For the further clearing up of our thought concerning the relation of inductive science to metaphysics we recall again some results reached in the *Theory of Thought and Knowledge*. Explanation in general, we saw, consists in referring an event to its causes, or in connecting it with other events according to law, or in relating it in a scheme of purpose. In the first case explanation is metaphysical, in the second scientific, in the third teleological.

In popular speculation the first and second are confused because of the general failure to distinguish the phenomenal from the ontological. But when thought is clear all three

forms are seen to be distinct and alike necessary for the full satisfaction of our mental demands. When we have named the cause and the purpose of nature, we have gained no insight into the methods of the cause, or of the way in which the purpose is realized. And when we have discovered the uniformities of nature, we have gained no knowledge either of the cause or of the purpose of nature. When we are speaking of causes, metaphysics is in its full right and has the final word. When we are speaking of methods, inductive science has the right of way. We are seeking to connect events with other events in an order of law; and both metaphysics and teleology are irrelevant. We can make absolutely no use of theological suggestions in this field. We may, indeed, not find the law we seek, but the law, whatever it may be, must be sought within the order of phenomenal experience. Finally, when we are seeking to interpret nature teleologically, it is quite irrelevant to object the way in which events are brought about. No doubt events come to pass in some way, but that does not decide whether they mean anything when they do come to pass. Walls are built by laying stone on stone or brick on brick; but this fact does not reveal the plan of the building, still less does it disprove a plan.

We repeat this matter in another form. Apart from the general question of causality, every event has a dual aspect. We may view it from the stand-point of purpose, and try to tell what it means. And we may view it as an occurrence in the cosmic series, and try to comprehend it in the order of law. In the former case it expresses a purpose; in the latter case it is an outcome of law. In the former case it appears as purposed; in the latter it appears as product. These two points of view are necessary for our complete understanding of anything; and they can never collide except through that crude metaphysics which erects the

system of law into a self-running and independent mechanism.

Separate things should be kept separate. The cosmic movement has these several aspects; and neither the scientific nor the teleological aspect admits of perfect insight. However much we may believe in purpose, we can trace it but a little way. And however much we may believe in the reign of law, we can trace it only in general outlines and in a superficial manner. We trace it in a way which serves for practical purposes rather than for theoretical insight. If we seek to go farther than this we stumble into metaphysics, and begin to talk of "subtle tendencies" and "the nature of things," and possibly even of "Nature" herself; and these are mouth-filling rather than mind-filling phrases. When we examine ourselves we find that we have nothing in mind in such cases beyond the abstract category of ground; and metaphysics shows that this notion vanishes unless we raise it to the form of free intelligence. We need to bear these several aspects of the problem in mind in order to vindicate for each its proper field and significance, and especially to ward off that crude dogmatism which makes the dicta of science all-embracing and final. Inductive science has the right of way in its own field, and only in its own field. And after it has made all possible discoveries in that field the metaphysical and teleological problems remain untouched.

We are really not under obligation to have a scientific theory unless we can find it in the facts; or, rather, we are under obligation not to have such a theory unless we can find it in the facts. When the facts themselves do not give it we must wait for light, and meanwhile have recourse to teleology and metaphysics for such help as they can give. But no theory is better than a fictitious one. Ignorance is often a virtue, but sham knowledge is an intellectual crime.

Lord Salisbury, in his Presidential Address before the British Association for the Advancement of Science, gives the following quotation from a distinguished scientist, which well illustrates the confusion of current thought on this matter:

"We accept natural selection, not because we are able to demonstrate the process in detail, not even because we can with more or less ease imagine it, but simply because we must—because it is the only possible explanation that we can conceive. We must assume natural selection to be the principle of the explanation of the metamorphoses, because all other apparent principles of explanation fail us, and it is inconceivable that there should be yet another capable of explaining the adaptation of organisms without assuming the help of a principle of design."

This is a very instructive quotation. It shows the logical rashness of the dogmatic mind, which must have a theory at all hazards. The process cannot be demonstrated in detail; it cannot even be imagined in most of its supposed applications. And yet it must be affirmed, for we must have a theory; and we cannot conceive of any other which would not involve design. But why must we have a theory unless it helps us to insight? We cannot conceive of any other, but it seems that we cannot even conceive of this. It is only the ill-starred mind which must have a theory that would insist on theorizing under such circumstances. All other minds would recognize the impossibility of referring the metamorphoses of the organic world to any inductively discovered principle, and would content themselves with classifying and describing organic forms according to their affinities and various relations. This would not take us very far, indeed, but it would be real and not sham knowledge, so far as it went.

The emptiness of this principle of selection has been

pointed out in the *Theory of Thought and Knowledge.* When the anthropomorphism is eliminated, we said, the principle reduces to the survival of the fittest; and when the ambiguity is eliminated from the latter principle, it in turn reduces to the statement that the able to survive survive and the unable to survive do not survive. That this is true is certainly unquestionable, but unless we can point out in particular cases the fitness which leads to survival, or the unfitness which leads to non-survival, we make no progress. We merely shuffle the abstract notions of fitness and unfitness, and draw the barren conclusion that whatever survives does so because of its fitness, and whatever fails to survive does so because of its unfitness. We know that it was fit because it survived, and unfit because it failed to survive; and, being fit or unfit, it could not fail to survive or not survive; and what more is there to wonder about?

Some of these days even teleology will be found to be a relief from this barren play of words. Meanwhile, we point out that to get any light from this principle, we must be able to show what the fitnesses and unfitnesses are, and in particular how the fitnesses arise, and how they fall out in such a way that an orderly system of organic existence emerges. When the unfit is defined as unable to survive, we can readily see that it cannot survive; but the arrival of the fit, and its arrival in so many forms, are left quite unaccounted for by the great principle of natural selection. Yet these arrivals contain the knot of the problem. A few cases of arrival and survival may make no impression of purpose, but when the sum of arrivals and survivals is the orderly system of living things the case is different. But popular thought lingers among details without any thought of the whole, and thus gets no impression of purpose whatever.

There are a great many showy arguments which in their abstract form seem invincible, but which, nevertheless, look very different when concretely applied. Then it often appears that various riders have to be added which reduce them to commonplaces, if not to nothingness. The following is an illustration:

"Organic form is the result of motion.

"Motion takes the direction of least resistance.

"Therefore organic form is the result of motion in the direction of least resistance."

The major premise is undeniable. The minor premise is a mechanical axiom. The conclusion necessarily follows. And thus we see from this beautifully simple syllogism how the organic world necessarily results from elementary mechanical laws. To be sure, we cannot by any reflection on those laws deduce the result, but, by reflection on the result, we see that it must come under the law. If, then, any one should be inclined to wonder at the complexity of organic forms, we quietly refer him to the principle that motion takes the direction of least resistance.

But the argument admits of endless application. Thus:

The writing of a book, say *Paradise Lost*, is a case of motion.

Motion takes the direction of least resistance.

Therefore, the writing of *Paradise Lost* is the result of motion in the direction of least resistance.

This argument is just as good as the other. And now it begins to dawn upon us, either that the line of least resistance is an enormously complicated affair, which implicitly contains the whole system of effects, or else that the line is determined by something beyond it. If, for instance, the line of least resistance is determined by some immanent organic law, or by the thought, purpose, and volition of the writer, the formal argument is as good as ever, but its

purely verbal character is evident. The application to natural selection and the survival of the fittest is manifest.

Our scientist insisted that we must affirm natural selection as the principle of the metamorphoses in the organic world. The reply is that we are not under obligation to affirm this or any other principle, unless it pays expenses. Now it is perfectly clear that this principle, when raised from a very subordinate position and made universal, becomes a barren formalism, leading to no insight, and largely a tautology. The rest of his claim is equally instructive. Either we must affirm natural selection or have recourse to design. Of course this would be in the highest degree unscientific.

And it would be unscientific in the technical sense. Inductive science as such knows nothing of God, and has no occasion to know anything. It moves in another field altogether. Design is not technically a scientific hypothesis. If one were trying to see how the parts of a complex mechanism hang together, it would be quite absurd to tell him to look for the design. Design might throw light upon the existence of the whole, when one is looking for the ground of the arrangement of the parts, but it can never tell what the arrangement is. Equally irrelevant is the reference to design in the world movement, when one is looking for the forms of that movement, and for the laws according to which phenomena are connected. But of this division of labor our scientist has no suspicion. He tacitly erects nature into a self-running mechanism which has no root in purpose, and opposes natural selection to design as being its contradiction.

Now all this is very crude and superficial logic and metaphysics. Science as such has no place for design; but reason, which is the source of science, has a place for design. Teleology is unscientific in the technical and limited

sense, but it is not unscientific in the sense of being false. Moreover, it seems there is no scientific explanation. The one offered cannot be demonstrated in detail, and cannot even be imagined in many of its applications. Besides, if we had a scientific explanation, it would not exclude the teleological one; for this only claims that the net result of all the arrivals and survivals in the organic world is such as to be unintelligible without the assumption that they root in purpose somewhere, whatever the method by which they have been reached. Nor is the view any more unscientific than the alternative doctrine, when the scientific explanation is thought through to its metaphysical basis. If we reject the control of purpose, then we must find the ground for all the complex forms of nature in the nature of things, subtle tendencies, latent laws, mysterious affinities, etc. But this matter is not only unscientific in the technical sense; it is unscientific in any sense, being simply bad and impossible metaphysics.

Nature as the System of the Finite

From the form of our experience the physical world is the great object of thought. Hence it results that the notion of nature is generally and often exclusively built on physical lines. But by and by we recollect that man is also a part of existence, and that we must make some provision for him. Then if our thought is not very critical we tend to make man a physical product. Or if we see the impossibility of this view we tend to transform our thought of nature so as to make it all-inclusive. We see that man cannot be made a function of physical nature, but then physical nature is not the sum or sole reality of nature. It is rather only one aspect of that all-embracing nature which produces alike the inorganic and the organic, the

physical and the spiritual. The apparent antitheses of experience, as the living and the dead, the spiritual and the material, man and nature, are only phenomenal; and they all vanish in the unity of the one mysterious nature from which all things proceed. If we knew all we should see that all things are natural and have their natural explanation.

This notion results from the desire for unity working under the limitations of sense metaphysics. Eliminate these, and this mysterious nature becomes simply a name for the fundamental reality, and its properties remain a problem for investigation. But there is implicit in the doctrine the conception of an impersonal existence and of necessary causation, and the claim is that if we knew this impersonal somewhat and its necessary activities, we should find it including and explaining the whole system of the finite.

The untenability of this notion we have long since seen. Both the impersonal existence and the necessary causation have been cast out as evil. This nature is one of the idols of the speculative den which is seen in its true character as soon as it is brought into the light. Epistemology convinces us that nature has neither existence nor meaning except for and through intelligence.

Yet after all there is a certain interest underlying this notion of nature; but the speculator does not know what it is, and seeks to satisfy it in impossible ways. The things to be secured are the continuity of law and the possibility of comprehending all things under some law-giving plan. Things must not exist at random. Events must not occur at hap-hazard. Whatever antitheses may be found in experience, they must admit of being comprehended in a deeper plan which unites and explains them. But these demands cannot be met by any impersonal mechanism,

but only by the constitutive intelligence which founds and maintains the order. Considered in itself, nature is simply a form of working for the expression and realization of a thought or plan. Its continuity is intellectual, and all its laws and phenomena, its constants and variables, are to be understood from the side of this plan. In the realm of nature that which was does not in the deepest sense explain that which is, but that which was, that which is, and that which will be, are all to be explained, logically, by their relations to one another in the plan of the whole, and, metaphysically, by that Living Will which not only worketh hitherto, but worketh still and worketh forevermore. Logically, all things explain all things, that is, imply all things in the plan of the whole, the future implying the past as much as the past implies the future. Dynamically, no impersonal thing explains anything, for all such things are but phases, constant or variable, of an activity beyond them.

Natural and Supernatural

Every one familiar with anti-religious polemics will recognize that the discussion has largely proceeded on a certain conception of the natural. Evolution would never conflict with religion but for a peculiar conception of the natural. No one would ever have dreamed of a conflict between science and religion but for a particular conception of the natural. In history, also, all alleged supernatural occurrences are to be looked upon either as fictions or as misunderstood natural events. A natural interpretation of all events is insisted upon, and this is held to exclude the supernatural. Thus the natural and the supernatural are set up as mutually exclusive, so that the more we have of the one the less we must have of the other.

Of course an event may be natural and yet be apparently

a great departure from the familiar order. The continuity of natural law is compatible with great phenomenal discontinuity. We often have apparent departures from the familiar order; but, on closer inspection, it is found that the essential order of law is maintained even in its seeming infraction. Thus, an earthquake may be a departure from the accustomed immobility of the earth's crust; but it is nevertheless the outcome of the familiar laws of physics. Thus, again, the freezing of water in a flame seems like a contradiction of natural law; and yet the laws of physics are not violated, but rather illustrated, by this fact. Having once mastered this distinction between essential continuity and phenomenal discontinuity, we become somewhat tolerant even of apparently miraculous stories, only nothing of the supernatural must be allowed in them. Cures at shrines, or by means of relics or holy water, or by formulas of blessing or exorcism, become quite credible if we may view them as cases of the influence of the mind on the body. Even witches, who have long been under the ban, are becoming a fairly intelligible folk since the development of hypnotism.

Now in this there is a double assumption. First, nature is supposed to be a metaphysical system with divers resident forces by virtue of which it produces a great variety of effects which, as products of nature, are natural. Secondly, this nature is tacitly and often avowedly supposed not to root in, or be subordinate to, intelligence anywhere. If rooted in intelligence at all it is so only as to its general forms and laws, and not as to its details. In either case, nature is conceived as a blind causality which does a great many unintended things on its own account. This notion is the source of the difficulty so many feel over the doctrine of evolution, and also of the traditional polemic concerning prayer and special interpositions in general. The

naturalistic interpretations of religious history have the same root. In all of these cases there is a latent or explicit assumption that whatever can be referred to natural agency is thereby rescued from any purposive interpretation.

But allowing that nature is at present a metaphysical fact with inherent resident forces, this conclusion does not follow, unless it be shown that nature is essentially blind, mechanical, and self-existent. If nature be dependent on intelligence, then all its phases and products must be referred to intelligence. All that the rational believer in purpose cares to maintain is that natural products are intended, however realized; and what the unbeliever should show, in order to give his claim any significance, is that they root in no purpose anywhere. If an event represents a divine purpose, it is as truly purposeful, when realized through natural processes, as it would be if produced by fiat; and it would be as "special" or "particular," if thus produced, as it would be if created on the spot. In any other sense than that of being intended, it is unnecessary to insist upon anything special or particular in the flow of events; and in this sense it is hard to see how any theist can reserve anything from being special and particular. We may not be able, indeed, to trace the meaning in an event, but if there be meaning in anything there is meaning in all things. It is only superficial thought which fancies that mechanism displaces meanings.

Familiar oversights are apt to master us here. First, the fallacy of the universal misleads us into thinking that the creative act produced only a system of things in general, and that this system then wrought out on its own account a set of particular effects for which no one is responsible. General laws and classes were the first and only created product; and thereafter things got on by themselves. But

these laws and classes as such contain no hint of concrete and particular things and events; and hence the latter are thought to be no part of the original plan. Through this deceit of the universal they fall out of our thought, and are supposed not to have been in the creative thought. Thus, finally, they sink down into unintended by-products of the natural mechanism, and admit of being thought meanly of.

The naïve superficiality of all this is evident. General laws and classes can have real existence only in concrete and particular application. There is and can be no system of things in general. If then we suppose that God created a system of nature which was intended to unfold according to inherent laws, we must say that the creative act implied and carried with it all that should ever arrive in the unfolding of the system. There is no way by which things or events could slip in which were not provided for in the primal arrangement. Mechanism can only unfold its own implications; it can make no new departures so as to reach anything essentially new. And if we suppose the Creator to have known what he was doing, we must suppose him either to have intended the implications, or to have been unable to prevent them. But the reality of the purpose is missed because of the deceit of the universal; and even if we allow it, it fails to make any impression upon us, from being far removed in time. Here we overlook the relativity of our time estimates and practically fancy that a purpose so distant must have faded out of the divine interest, if not out of the divine thought altogether.

The question of natural and supernatural, so far as it has a religious interest, is purely one of intended or unintended. But this question is obscured by supposing the issue to concern the method of realization; as if the natural were necessarily unrelated to intelligence, and as if purpose could be realized only by unnatural methods.

These conclusions would hold even if nature were a metaphysical reality; but nature is nothing of the kind. There is no substantial nature, but only natural events; and a natural event is one which occurs in an order of law, or one which we can connect with other events according to rule. But this order has no causality in it. In the causal sense it explains nothing. It is only a rule according to which some power beyond it proceeds. Its value for us is practical rather than speculative. But the cause lies beyond the law; this is the supernatural. But this cause is essentially personal and purposive; and the system of law represents only the general form of its free causality. The supernatural, then, is nothing foreign to nature and making occasional raids into nature, but so far as nature as a whole is concerned, the supernatural is the ever-present ground and administrator of the natural. It is not something of a scenic and arbitrary character apart from nature, but rather a supreme reason and will realizing its purposes under the form of nature. Hence events in general must be said to be at once natural in the mode of their occurrence, and supernatural in their causation. The commonest event, say the falling of a stone, is as supernatural in its causality as any miracle would be; for in both alike the fundamental reality, or God, would be equally implicated. As soon as we eliminate the crude metaphysics of uncritical thought we see that there is no more needless conflict anywhere in speculation than this which sets the natural and supernatural apart in mutual hostility.

Miracles

There is probably no discussion in which the ratio of bad logic to good has been greater than in that concerning miracles. With our conception of the divine immanence, of a

natural supernatural and a supernatural natural, the question loses all essential importance. Miracles in themselves would be no more divinely wrought than any natural event whatever. The only place or function we could find for miracles would be as signs of a divine power and purpose which men immersed in sense could not find in the ordinary course of nature. They might be necessary condescensions to human weakness, but they would root no more intimately in the divine will and purpose than any familiar event.

How to define a miracle has always been a question of difficulty; and the tendency has been to give specimens instead of definitions. Thus, to raise the dead would be a miracle. Answers to prayer concerning familiar matters, it is said, would not be miracles. To the charge made by the unbeliever that an answer to prayer involves a miracle, the believer commonly replies with denial. Miracles are the great wonders which were needed for the original establishment of the faith, or for its vindication against its enemies; and the age of miracles has long since passed away.

But this attempt to fix the definition of miracle by sample never fails to awaken criticism. It seems to make the miraculous character to depend not on the fact of a departure from the order of nature, but on the size of the departure. Small departures, then, are not miraculous, but large ones are. Now a disciple of logical rigor and vigor can never endure any such shuffling and shilly-shallying as this; and he hastens to announce that any departure from the order of nature is a miracle, and of course is to be denied. Not merely the stories of sacred books, but answers to prayer of all sorts, providential interferences, spiritual leadings, inspirations, etc., must be set aside as miraculous.

There is an air of great clearness to this which almost excuses its peremptoriness. Unfortunately, this clearness is only apparent. If we mean by a departure from the order

of nature the production of something which nature left to itself would not produce, we must say that physical nature, where the admission of miracle is pre-eminently perhorresced, is the scene of continuous miracles. For that nature is perpetually undergoing modification and taking on new forms because of human volitions which play into it and produce effects. These effects cannot be deduced from the antecedent state of the physical system, but are interferences, interpolations, interjections from without. If these are miracles, and so abundant, there seems to be no good speculative reason why we should object to miracles in general. But if they are not miracles, then, it appears, we may have interferences, etc., which represent and realize purpose in the system, but which, as being every-day occurrences, are not to be called miraculous.

Miracle, then, in the sense of effects interpolated into the order of law without being a consequence of that order, would seem to be a fairly familiar fact of experience. If we should think to avoid this conclusion by saying that physical nature alone would not explain the effects, but nature as a whole, including man, would explain, we should have a perfectly barren contention, as long as we left man free, and a self-destructive one if we should include man in a scheme of necessity.

These considerations suggest, what reflection confirms, that the traditional debate respecting miracle is marked by all the confusion and uncertainty which appear in the popular notions of the natural and supernatural. Neither party to the debate is certain of its own position or has any consistent position; and whichever party attacks wins.

From our own point of view the natural has its source and abiding cause in the fundamental reality, which is living will and intelligence; and physical nature is throughout only the form and product of its immanent and ceaseless

causality. The question of miracle, then, is not a question of natural *versus* supernatural, nor a question of causality, but solely and only a question of the phenomenal relations of the event in question. The natural event is one which comes in a familiar order, or one which we can relate to other events according to rule. The miracle could only be viewed as an event arriving apart from the accustomed order and defying reduction to rule.

This question goes deeper than at first appears. It raises first the query what objective and logical ground we have for believing in a fixed and all-embracing natural order. The answer must be that we have no such ground which does not either rest on theistic faith or else float in the air as a subjective postulate. Thought needs such an order for the realization of its own tendencies, but that does not prove its existence. In a rational system we can infer something from the experience and anticipations of our own reason, but in a system not rooted in reason nothing can be inferred. In an atheistic scheme psychological expectations may be formed, but they constitute no logical warrant. Nothing is possible on such a view but dogmatic assumption.

An order of law, then, becomes a rational thing and furnishes ground for rational assumption only on a theistic basis. From the orderly nature of intellect we should expect order and consistency in its activities and products. Now from this stand-point there is a decided presumption against miracle, and the presumption arises from the nature of intelligence itself. And nothing can save us from rejecting miraculous stories as antecedently incredible, except the showing of an adequate reason for their performance. And in deciding what an adequate reason may be, men will judge one way or the other in accordance with their explicit or implicit assumption concerning the meaning of the world

and life. If they think that nature is there on its own account, and that its highest law is that $\frac{1}{2} MV^2$ shall remain a constant quantity, there is no question as to their position on miracles. The one sacred thing will be $\frac{1}{2} MV^2$, and if there be anything which interferes with that, *anathema sit.* And if, on the other hand, there be any who hold that nature is second and not first, that it is meant to serve moral and religious ends, they will find no *apriori* difficulty in the notion of miracle if they find it occurring in connection with spiritual exigencies which could have been met in no other way as well. Abstract and unrelated wonders might conceivably be proved by abstract testimony, but such questions have only academic existence; and however much evidence might be offered for such wonders, they would inevitably fade out of rational belief, until at last no one would even take the pains to deny them. The reason is that such wonders are essentially incredible in a world which roots in a supreme reason and a worthy purpose. But faith or unfaith in all miracles roots too deep in life to be entirely amenable to logic. Logic, however, may be allowed to remark that those persons who think that "science demonstrates the impossibility of miracles" or that "science shows that miracles have never occurred" might possibly be helped by a few lessons in logic.

But, on the other hand, the believer in the omnipresent supernatural, if he be at all skilled in logical and psychological reflection, or learned in history, will steadfastly maintain that the supernatural manifests itself chiefly and almost exclusively under the natural form. Only thus can nature be the instrument of our instruction and development. Only thus can the mental and moral sanity of individuals and the community be secured. Only thus can the low, wonder-loving tendencies of the untrained intellect be prevented from plunging men into unfathomable depths

of superstition. Only thus, finally, can many individuals be saved from abysses of fanaticism and conceited uncharitableness, because of fancied visions and revelations. In a time when men have lost themselves in the mazes of impersonal mechanism, they need enlightenment so as to find God in the law, but at all times they equally need to recognize the law, even if it should temporarily hide God from them.

Nature as Idea

In the *Theory of Thought and Knowledge* we have discussed the general question of idealism, pointing out, however, that the full discussion involves metaphysics as well as epistemology. We recur to the subject here for the sake of emphasizing the phenomenality of external nature; that is, its existence only in, for, and through intelligence. On whatever line we approach the subject, we find thought able to save itself from contradiction and collapse only as all reality is taken up into mind. The extra-mental world of sense-thought is seen to be a misreading of experience; and it must inevitably vanish before criticism. A thought world is the only knowable world; and a thought world is the only real world. And of this world intelligence is at once the origin and the abiding seat. Nature as being vanishes instantly unless we raise our thought to the abiding idea which binds the successive phases into one conception. The rational ideas and relations and system in what we call things are the only thing with which thought can deal; and they are nothing in abstraction from a mind which constitutes and maintains them.

Here our study of nature ends. It has been of set purpose exceedingly repetitious, as in no other way did it seem possible to reveal the multitudinous forms which the bad

metaphysics of crude thought assumes on this subject. We emerge finally with the conception of the finite spirit in the presence of a phenomenal system which forever proceeds from the immanent energy of the one Living Will. This system cannot be deduced by any *apriori* reflection, but must be learned from experience. Still it is possible to learn something of its laws and to construe some of its meanings; and all our effort should be directed to this end.

In neither case, however, can we reach anything like completeness. From our theistic stand-point, we are forced to find the reason why the system is as it is in the purposes of the infinite. This fact, in itself, would not be incompatible with an insight into these purposes, and into the means of their realization; but both the purposes and the methods of accomplishment are largely hidden from our knowledge. In most cases, where design is manifest, the end seems to have little worth; and where a worthy end is affirmed, the system seems quite indifferent, if not inimical, to its realization. The only end which can be allowed to have absolute value is an ethical one; but it is hard to detect any relation to such an end in the mass of cosmic details. It is still harder to find any reason why this end might not have been secured in a more direct and efficient way. Viewed as a whole, the great cosmic drift does not seem to set very decidedly in any direction, and the mass of results seem more like products than purposes. The great forms of elementary activity are maintained, and in their interaction they give rise to various products to which it is difficult to ascribe any further significance. The belief in purpose in the system has its special embarrassments as well as its advantages. We cannot do without it, and it is not easy to do with it. In particular, it precipitates upon us the great mass of failure, insignificance, and mischief which forms so large a part of visible nature, and demands an interpretation.

And here all human wisdom is at an end. The problem of evil to which these questions belong admits of no speculative solution at present. We cannot give up our affirmation of purpose, but we must admit that the purposes of the system are mostly inscrutable. Yet, still, we hold that neither the existence nor the circumstances of the cosmos are in any respect ontological necessities, but, both in extent and duration and character, it is what the plan of the creator calls for. Whether uniform or variable, stationary or progressive, depends on something deeper than itself. It is possible that the elementary forms of action are fixed; and it is equally possible that these also undergo variation. The necessary uniformity of natural law is a postulate for which we have not the slightest rational warrant. Experience is the only source from which we learn what the laws of nature are, and from which we learn that they are even relatively fixed. To what extent they are relative to ourselves, our circumstances, our terrestrial life, is beyond us.

Of course speculators of the dogmatic type will take umbrage at this conclusion; and they will complain that science is not provided with a secure basis, and that honor enough is not done to the majestic conception of nature, the mother of us all, *natura naturans*, *ordo ordinans*, etc. But as to science, we must remember the relativity and incompleteness of actual science. If it will hold for "a reasonable degree of extension to adjacent cases," it will do all we can ask of it. As to absolute science, the will and purpose of the supreme reason will seem the best foundation we can get to all but those whose peculiar type and experience of intelligence make a lump the only thing that is sure and steadfast. And as to that nature with the big names, the only way of getting it is to ignore, or be ignorant of, all the results of philosophic criticism, and demonstrate its existence by giving us the speculator's word of honor.

Part III

PSYCHOLOGY

CHAPTER I

THE SOUL

Thus far we have dealt either with the general metaphysical categories or with so-called material existence. In Part II especially we have treated of physical nature. We have now to consider the world of mind.

As the metaphysics of nature does not involve a study of details, but only of the fundamental conceptions on which the doctrine of nature rests, so the metaphysics of mind does not concern itself with the details of descriptive psychology, but only with the basal ideas on which that psychology rests. Until these are mastered, empirical psychology is a mere chaos of alleged facts, partly true and partly false. And the facts themselves, like the facts of physical nature, depend for their interpretation on some metaphysical conception. Accordingly, it is found that the various schools of psychology, like the various schools of cosmic speculation, agree as to the phenomena, but differ in their metaphysics. Hence, also, harmony and advance are to be secured, less by a thoughtless heaping up of observations than by a study of the metaphysics of psychology. Induction which is guided by no principle leads to nothing, whether in psychology or elsewhere.

The central point in popular psychology is the doctrine of the soul. This necessarily results from the form of our mental life. In all articulate experience the self appears as the abiding subject, the same yesterday and to-day. The

experience is owned; and the owning self which thinks and feels and wills we call the soul. The soul is equally the central point in metaphysical psychology; and the conception we form of it has profound significance for our doctrine of thought and knowledge, and thus finally for philosophy and science themselves. However abstract the question may be, it has deep practical significance.

In spontaneous consciousness the mental subject is given as active and abiding; and the race has constructed various names for it, as mind, soul, spirit, and their equivalents, to indicate its reality. The structure of all thought and language concerning the inner life also implies it. This general conviction of the race we believe to be correct. Nevertheless it is disputed on various grounds; and the soul is declared by many to be only a name for a group of states of consciousness, more or less complex, which are produced in some way or other, but which inhere in no substantial or active subject. This view we proceed to discuss.

The question concerning the reality of the soul is commonly called the question of materialism or spiritualism; but these terms are hardly exact without some further determination. The true question is whether the soul be a proper agent acting out of itself, or whether it is only a name for a set of states of consciousness produced and brought together from without, by physical organization or otherwise. The view which maintains the former position we call spiritualism.

For the other view there is no single satisfactory name. Materialism is the term most commonly used, but it is often repudiated with warmth, and even with indignation, by those to whom it is applied. In the general confusion which infests the metaphysics of physics, materialism itself has become ambiguous. It may imply the crude theory of matter held by uncritical common-sense, and it may imply

merely the unreality of mind. Clearly one might be a materialist in the latter sense without being such in the former. One might repudiate altogether the crude lump notion of matter, regarding it as something subtle, mystic, wonderful, and at the same time he might hold that the mind is only the unsubstantial product of organization. This is the source of those indignant denials of materialism which common-sense finds so bewildering on the part of many speculators of the evolution type. Materialism may be defined by its doctrine of matter or by its doctrine of mind. Common-sense defines it by its doctrine of mind; and whenever it finds any one affirming the inactivity and unsubstantiality of mind, it calls him a materialist. For common-sense every system which reduces mind to a sum of mental states and then views these states as the result of organization is materialistic, no matter what it may call itself, or what its metaphysics may be. It may be nihilism, idealism, pantheism, or agnosticism in its doctrine of existence, and be materialism in its doctrine of mind. Historically these apparent contradictions have often been yoked together in one system.

Materialism

The denial of the substantial reality of the soul finds its popular expression in traditional materialism. On this view the soul is substantially nothing. The various states of consciousness exhaust the fact, and these are produced by the physical organism. The organism in turn is only a special material aggregate. A complete knowledge of its factors would enable us to understand its mental as well as its physical manifestations.

If we should appeal to the results of our previous study we might regard the debate as already decided against materialism. We have found that matter is only a substanti-

ated phenomenon, and can lay no claim to a properly substantive existence. Only spirit fills out the notion of being; and the only being of which we have any proper experience is ourselves. But inasmuch as we have returned again and again to the stand-point of spontaneous thought, we do so once more and open the discussion on the assumed reality of matter and on the basis of popular metaphysics. In this way we shall better understand the superficiality of the doctrine. Later on we shall consider the deeper metaphysical difficulties in the light of a profounder metaphysics.

The positive argument for materialism is undecisive. It consists entirely in appealing to the familiar fact that the condition and development of the organism have important bearings on the mental life. But this fact would result on any theory. If, as every one admits, the mind is now organically conditioned, it is plain that the health and perfection of the organism must have a profound significance for the conscious life. But there is no need to dwell upon truths so nearly self-evident. It will always be a highly important duty of the physician to study the mental significance of pathological physical states: but only extreme superficiality can expect thereby to solve the problem of the soul.

The chief source of materialism of this type is ignorance of both physical and mental science. The physical and the mental life appear together, advance together, fail together, and disappear together. Viewing these facts superficially, we very naturally come to the conclusion that the physical causes the mental. The conclusion is perfectly clear and perfectly cogent.

But as soon as we come close to the facts both the clearness and the cogency vanish. The first thing which strikes us is the complete unlikeness of physical and mental facts. Thoughts and feelings have nothing in common with mat-

ter and motion; and no amount of reflection will serve to identify them, or to deduce one from the other as its necessary implication. But physical science deals only with matter and motion and moving forces, and all its explanations are in terms of these factors. The molecule and the mass are only specific groupings of material elements; and the forces with which physics deals are known only as related to motion. Hence a physical explanation of thought and feeling must consist in a representation of them in terms of material movements and groupings. Just as a given number of elements grouped in a certain way is a chemical molecule, so, if thought is to be physically explained, we must be able to say that a certain number of elements grouped or moving in a certain way is a thought.

In other words: all physical forces are moving forces, and their effects consist in modifying the groupings and movements of the elements. The new grouping or movement is the effect. If now the production of thought is to be assimilated to causation in the physical world, we must say that a certain grouping of chemical elements is a thought; and it might conceivably be brought under a microscope and looked at. But if thought is not such a grouping, then it demonstrably lies outside of the range of physical causation as the term is understood in exact science.

All but the crudest materialists recognize the absurdity of calling thought a movement or grouping of the physical elements, and the impossibility of viewing it as a case of physical causation, as generally understood. The notion that matter as commonly conceived can explain life and mind they declare "absurd, monstrous, and fit only for the intellectual gibbet." They propose, however, to escape the absurdity by a new definition of matter. Matter conceived as the movable explains only motion and aggregation; but

is it not possible that we have held too low a view of matter? Indeed, how can we tell what matter is, except by observing what it does? In its inorganic state it does, indeed, show no signs of life and mind; but it has other properties also which appear only under certain conditions. Its chemical affinities are not always manifest; and its building energies, as in crystallization, do not always appear. Apart from experience, who would have dreamed that a slender wire could take up human speech and deliver it miles away, or that water contains such mystic building powers as it shows on the frosted pane? Again, all matter has relation to magnetism and electricity; and yet these qualities but seldom reveal themselves. Why may we not say that mental properties also are hidden in the mysterious nature of matter, and manifest themselves upon occasion? They would not, indeed, be deduced from the other properties of matter; but they would, nevertheless, belong to the same subject as the physical qualities. All definitions of matter which exclude life and mind are inadequate, if not untrue, we are told; but what warrants us in excluding them? What matter as the movable cannot do, matter as the mystic may well accomplish. Why not?

This is the higher materialism. It views materiality and mentality as opposite sides of the same substance. It even regards itself as the higher unity which transcends and reconciles both materialism and spiritualism. Vulgar materialism, on the other hand, it stigmatizes as the materialism of the savage. Monism is the name which this view especially affects at present.

This monism is the crude product of crude reflection, and represents some of the most extraordinary antics in the history of speculation. Genuine speculative principles are latent in it, but, not being mastered, they lead only to confusion. In this respect they are like the religious principles

latent in fetichism or totemism; they fail to lift the product into rationality, and leave it on the plane of superstition. We must seek to help the doctrine to self-consciousness.

It is difficult to give this view a form sufficiently definite for criticism. Its root in sense metaphysics is manifest. Existence in space is tacitly assumed to be the only real existence, and, of course, all phenomena must find their source in it. When, then, vital or mental manifestations are discovered, there is nothing to do but to refer them to matter, and to enlarge the notion of matter so as to meet the new demand. The ontology of sense thinking hardly admits of any other conclusion.

There is no need to criticise this ontology, as we have long since set it aside. But it is worth while to study the curious logic of the view in question. There is an air of profundity and cogency in the reasoning which disappears on examination. Thus, when it is proposed to define matter as the mysterious cause of all phenomena, both of the outer and of the inner world, it is plain that we get only a phrase for our pains. The cause being mysterious, its nature remains a problem. The cause of mind is matter by definition, but what matter? Matter as the sufficient explanation of physics? Not at all. Such a conception is "absurd, monstrous, and fit only for the intellectual gibbet." It is that matter of which we read, "If life and thought be the very flower of both [matter and force], any definition which omits life and thought must be inadequate, if not untrue." Such matter might well explain mind, being already mind itself.

Of course this matter is not the phenomenal bodies about us, as trees and stones and clods in general. Such things would never be offered in explanation of thought, or as having a thought side. The matter in question is not phenom-

enal, but ontological, the dynamic matter of scientific theory or of physical metaphysics. Here, if anywhere, the subjective aspect is to be found.

But is this matter one or many? The term indeed is one, but what of the thing? As the materialist is very fond of physical science, and generally gives it to be understood that he has the prestige and majesty of science on his side, we naturally conclude that matter is to be taken in the scientific sense. Matter then is many; and the reality is a multitude of physical elements, each of which is endowed with sundry mystic or mental properties whereby, upon occasion, they become the sufficient explanation of our mental life. The real thing is the elements, and their main business is to be and carry on the physical order; but now and then, especially, if not entirely, in connection with organized bodies, they do a little in the mental line. Thus physics is assured of its field and essential priority, and psychology becomes an unimportant appendix of the physical realm, of somewhat obscure origin no doubt, yet certainly rooted in the physical world.

This notion has a certain plausibility for superficial reflection. To be sure it does not really deduce the mental from the physical, for both aspects are posited as original endowments of the elements, yet a certain unity seems to be secured by calling them endowments of the same thing. Unless carefully managed, also, the doctrine results in turning the elements into little souls, in order to explain away the only souls of which we know anything, namely, our own. But this, too, is easily overlooked. Finally, the doctrine is the extreme of pluralism, but this is readily hidden by calling it monism—a device so effective that it is likely long to remain in fashion.

But an unhappy dualism has emerged in the doctrine in the attempt to fix the relation of the physical and the men-

tal facts. We may call the changes of position, grouping, and movement, which arise in connection with thought, the physical series; and the changes of thought and feeling which attend the physical changes, the mental series. Some persons with a gift for expression have called them respectively neurosis and psychosis. How does this doctrine conceive their relation? Several conceptions are possible.

First, the two series may be conceived as mutually independent. They both depend indeed upon a common subject, but within the unity of that subject each series goes along by itself. In that case the mental series would be self-contained and independent, so far as the physical series is concerned. Nothing that happens in the latter would be the ground for anything in the former; and there would be no reason for affirming a real physical series. Psychosis does not amount to much in reality, but it is important in the theory of knowledge; and neurosis must be careful in dealing with it, or it may cancel itself.

But the materialist is sound on neurosis. The physical series is the independent and universal fact; and psychosis must accommodate itself thereto. Out of this necessity arises a second view and also a second difficulty. The physical series is subject only to the laws of force and motion. If now we aim to make the physical series self-contained and independent, we must deny that physical energy ever becomes anything else. For if physical energy is really spent in producing thought as thought, the continuity of the physical series would be broken, and energy would disappear from the physical into the mental realm. In that case, either energy would be lost, or thoughts would be as real and as active as things. The latter view cannot commend itself to us as materialists, and hence we are shut up to the view that the physical series is self-contained and independent. It suffers no loss and no irruption. Both

energy and continuity are absolutely conserved. Each physical antecedent is entirely exhausted in its physical consequent; and conversely each physical consequent is fully explained by its physical antecedent. In the strictest sense, the physical series goes along by itself, and subject only to the laws of force and motion. But in such a view, thought as such cannot be an effect of the physical series; for under the law of conservation there can be no effect which does not in turn become a cause. If energy is expended, it produces some other form of energy either kinetic or potential, and this new form possesses all the causal efficiency of the old. Hence, as the physical series is assumed to be continuous, and thought is powerless, thought is shut out from the series of cause and effect. We must, then, hold that physical energy is never spent in producing thought as thought, but only in producing those physical states which have thoughts for their inner face. These thoughts, again, as thoughts, are powerless. They affect the physical series not as thoughts, but as having physical states for their outer face. The thought-series as such is not the effect of the physical series, but simply its attendant. When the physical series is of a certain kind and intensity, it has a subjective side; but the reality, the energy, the ground of movement are entirely in the physical series, and this goes along by itself. No study of this series as such would reveal the thought-series which accompanies it.

The view thus presented is the current one among materialists. From fixing their thoughts exclusively on the physical series, and from their desire to avail themselves of the doctrines of physics, they have been led to deny all energy to thought as such, and to affirm the continuity and independence of the physical series. Sometimes they will not even allow thought to be a phenomenon of matter, but degrade it to an "epiphenomenon." This of course saves the

physical continuity, but at the expense of another order of difficulty. Thought is reduced to a powerless attendant on some phases of the physical series, or to a subjective aspect of certain physical activities. But there is no assignable ground for this subjective attendant in general, and of course there is no ground why it should attend as and when it does. If we could look into a brain, we should see on this theory a great variety of molecules in various kinds of movement. We might see right- or left-hand spiral movements, or circular, or elliptical, or oscillatory movements. Some of these movements would be attended by thoughts and some not. But what is the ground of difference? Assume that an elliptical movement of definite velocity is attended by thought, while an oscillatory movement is not so attended, there is still no reason why either movement should be attended by thought, and also none why one should be thus attended rather than the other. Both the elliptical and the oscillatory movements confine themselves strictly to being what they are; and neither by hypothesis loses anything which passes into the thought-realm. If we might say that an elliptical movement is a thought, we might get along; but this view has been turned over to the savage. But since the elliptical movement confines itself to moving, and loses nothing for purposes of thinking, the thought-series appears as a gratuitous and magical addition to the thing-series. There is no reason why it should appear at all, and none why it should appear where and when it does. The most profound reflection upon molecular groups and movements reveals no reason why any should be accompanied by an incommensurable attendant, thought, or why one rather than another should be thus attended. If there were a mental subject in interaction with the physical series, it is easy to conceive that different states of that series might be attended by different mental states; but when this is not

the case, the connection is one of pure magic. The epiphenomena, being nothing, may need no explanation; but if they should need an explanation, there is nothing in the physical series to account for them.

Magic, however, is an evil word, and we must seek to escape it. We recur, then, to the doctrine that matter has a mental as well as a physical side, and that the former is as original as the latter. But in order to explain the form and peculiar character of any specific mental manifestation, we must further allow that the mental side is in interaction with the physical side. Without this admission, thought might appear at one place as well as at another, and in one form as well as in any other. The opposite faces in no way remove the necessity and complexity of this interaction. Thought in general is only a class-term; the reality is always specific thoughts about specific things; and in order that these thoughts shall appear as, and where, and when they do, it is necessary that the inner series and the outer series shall be in mutual determination. But this necessitates the further admission that the mental series is as real a form of energy as the physical series; and this raises the question whether matter as moving or matter as thinking and willing be the ultimate fact.

We are not at present seeking to disprove materialism, but only to understand it; and the task is no easy one. Into this discussion of the relation of the two series an ambiguity and an unreal simplification have already crept. By the mental series we may mean the thoughts and feelings which we call ours, or we may mean the mystical endowments, the subjective aspects, of the elements themselves. For the sake of clearness these meanings must be kept distinct. But this complicates the matter most unpleasantly. We have now three factors, the physical order, the subjective aspects of the elements, and our own thoughts

and feelings; and we have to determine their mutual relations.

When the materialist is pressed with these difficulties he is apt to solve the problem by saying that the mental series is an aspect, or phenomenon, or epiphenomenon of the physical series. Here the mental series means our thoughts and feelings; and phenomenon is the word which removes all difficulties. Unfortunately, it is the most treacherous ally the materialist can have; for where there is no subject there are no "aspects" and no "phenomena." Suppose n atoms turn in a left-hand spiral, and love is an aspect of this fact. But for whom? For the atoms? If so, for all, or for each, or for only one? If not for the atoms, for what or for whom? For the motion itself perhaps! A phenomenon as such cannot exist apart from consciousness. Hence a doctrine which would make thought phenomenal tacitly assumes the very mental subject it aims to deny.

The same is true for a still more thoughtless doctrine sometimes put forward, according to which the two series are identical. They are the same thing viewed in different ways. So far as this is intelligible it is absurd. The thing series is a set of moving elements; the thought series is a group of mental states. That one should cause the other is an intelligible proposition, however false; that one is the other is meaningless. Besides, the two ways of looking which make the one double imply a mind outside of the machine to make the notion possible.

We next need light on two other points of about equal difficulty, the relation of the physical aspect to the mental aspect of the elements themselves, and the relation of that mental aspect to our thoughts and feelings.

The first point remains in profound obscurity. The materialist seldom troubles himself about matters so occult. He knows that the inner aspect is there, and we know it

because he tells us. It does not seem to be a source of physical change, for that is provided for by the laws of force and motion; and we could not allow it to be such a source without seriously affronting the law of physical continuity. And, on the other hand, if we allow no dynamic relation between the inner and the outer we are quite at a loss to see, first, how the inner gets any hint how and when to manifest itself; and, secondly, how it can manifest itself in any case, seeing that the physical order is closed against it.

The second question, the relation of the inner aspect to our thought, is at once more intelligible and more difficult. Here we come upon the unreal simplification mentioned a page or so back. We speak of the aspect as one, whereas it is many. The elements being many, so are the aspects. Now what are these aspects? Are they thoughts and feelings? If so the elements are souls; and we are in the extraordinary position of starting out to find a physical explanation of our mental life, and coming back with a set of hypothetical souls with which to explain away the only soul we know anything about. If the aspects are not thoughts and feelings, what light do they throw upon our conscious life? There is no longer any thought in the case, but only words.

But allowing the aspects to be true thoughts and feelings, what is their relation to our thoughts and feelings? Are they a kind of raw material out of which our thoughts are made? Such a notion could be entertained only by an untutored imagination. Is there any way whereby these aspects may leave their respective subjects and congregate in the void to form a compound mental state which passes for me? Such a notion is as bad as the former. As well might a series of motions break loose from moving things and compound themselves in the void to form a new motion which should be the motion of nothing. These mental as-

pects, supposing them to be there, are absolutely useless in explaining our thoughts and feelings. They help the imagination by making possible crude fancies about "mind-stuff." They help the uncritical mind which has not learned the distinction between formal logical manipulation and real, concrete thinking. They make a show of satisfying the demand for unity and continuity in the system, but it is a false show. These notions are barely intelligible at their best, and when taken in earnest they soon appear in their utter worthlessness.

When matter is many the simple analysis of materialism reveals its hopeless confusion. As long as we treat the problem in a vague and superficial way, there is a kind of plausibility to it, but as soon as we understand the problem, materialism is with difficulty saved from perishing of its own absurdity without any further argument. Like the swine of the parable, it seems possessed to rush down steep places of nonsense into abysses of fatuity. But possibly we shall do better if we regard matter as one.

There is just vagueness enough in popular scientific thought to make this notion acceptable. The frequent use of such terms as monism, popular misunderstandings of the doctrine of energy, its conservation and transformation, and the growing tendency to regard the elements themselves as only functions of an energy beyond them, lend favor to the view. Let us say, then, that matter is one; is materialism any more tenable? Or, since monism is the name preferred by the holders of the new view, is monism any more successful than materialism in accounting for our mental life?

Monism

In this view we have one substance or energy with two aspects, an objective and a subjective one, or a physical and a mental one. In Spinoza's system, which was the earliest specimen of monism of this type, the one substance had two attributes; in modern systems it is more common to speak of two aspects, or faces, or modes of manifestation. Two points must be considered, the metaphysics of the view and its bearing on the question of the soul.

The first point is very obscure in the theory. Are the two faces of the one only aspects, or properly objective attributes? Spinoza himself was not certain. Commonly they were objective attributes, but at times even he regarded them as points of view, or ways of regarding the one substance—that is, as phenomena. The modern monist commonly views them as phenomena.

Supposing them mutually independent attributes, several questions arise. First, what becomes of the unity of the substance? Secondly, how is the parallelism of thought and thing which knowledge presupposes secured? Thirdly, seeing that knowledge is a mode of thinking and falls within the thought attribute, how can we admit a thing attribute at all, except as a phenomenon or mode of thought?

But supposing the faces to be only phenomenal, then the question arises, whence the thought which is the condition of all phenomena, and without which there could be no faces, or aspects, or unity of any sort? If it is our thought which sees the one as double and gives it its attributes, then that thought turns out to be the precondition of the monistic system itself. If it is not our thought, it is nevertheless thought; and then our system involves the one substance with the two aspects of thought and extension, and back of

these another order of thought as the condition of the aspects and their bond of union. Without this *deus ex machina* the system is contradictory; and with it the system is absurd.

Again, the two attributes, whatever they may be, cannot be conceived as passive qualities like extension, but rather as forms of activity. Thought exists only in and through thinking, and the physical world exists only through the constant forthgoing of energy. In that case we have one agent energizing in two entirely incommensurable forms, and apparently in such a way that the left hand knoweth not what the right hand doeth. Thought counts for nothing in the physical ongoing; and the physical ongoing has no significance for thought. There is not even a strained relation between them; and yet knowledge is made possible by hypothesis.

That the metaphysics of this monism is pretty crude is evident. A monism of some kind we must have, but monisms of this sort are such only in name. Active intelligence is the supreme condition of any real monism; and when we seek it elsewhere and look for thought among the objects of thought, we are sure to fall into such vagaries and crudities as those we have been considering.

But supposing the metaphysics possible, does this view help us to dispense with a real self in understanding the mental life? That it does not soon appears. Allowing all these queer things about aspects and faces, our thought is not explained. If we conceive the inner aspect of the one substance to be other or less than thought, no thought is explained. If we conceive it to be thought or thoughts, our thoughts are not explained. If the one substance has thoughts and feelings they belong to it and not to us; and they contain any account of our thoughts only for those unhappy beings who believe in mind-stuff, or who fancy

that thought may be cut up and parcelled out, or that thought is a material phenomenon which might conceivably be seen, or which can exist in any other way than in and through the act of the thinker. For all others it is plain that this view begins, continues, and ends in hopeless superficiality and confusion.

Thus far we have been mainly trying to understand the metaphysics of materialism, and we find it shaky enough. Our only interest in it is pathological. It is an instructive illustration of the implicit working of speculative principles in minds which have not risen above the sense plane. The sense categories warp the higher principles to themselves, producing the most fantastic results; and meanwhile there is not sufficient critical insight to detect the illusory nature of the performance. With our conviction of the phenomenality of matter and of all impersonal existence, and with the further conviction that active intelligence is the only reality, whether in the inner or in the outer world, materialistic metaphysics from beginning to end is simply illusion and error.

But materialism is weaker in its psychology and epistemology than in its metaphysics. To this point a word must be devoted.

Materialism has generally adopted the psychology and epistemology of empiricism. To be sure, the two doctrines are mutually destructive, but uncritical eyes are easily holden. In this view particular sensitive states are produced in or by the nerves, and out of these the higher contents of consciousness are built by repetition and association, aided and abetted by heredity.

In opposition to this view we recall the conclusions reached in the *Theory of Thought and Knowledge*. We saw that thought is impossible except through a unitary, abiding and

active self, that this self has never been other than verbally denied, and that when denied it is always forthwith reaffirmed in some figure of speech, or assumed in the language employed. The very nature of thought and language makes it impossible to maintain the denial without self-contradiction. Metaphysics further has shown that the self is the only reality of which we have any knowledge, and the only thing which fills out the notion of reality in distinction from phenomena.

As to the epistemology of materialism, it can hardly be said to have any. It takes knowledge for granted and as a matter of course. That knowledge is a problem, and that not every speculative theory is compatible with knowledge, are facts undreamed of. Nevertheless, while materialists may have no theory of knowledge, materialism has a bearing on knowledge. Its logical outcome is to make all knowledge impossible. As a system of necessity it breaks down on the problem of error, and reason collapses in hopeless scepticism.

For the practised reader this point needs no further illustration, but for the sake of the beginner we may be pardoned for some repetition of matter which ought to be familiar.

We have previously pointed out that the materialistic doctrine of the relation of the thought-series to the physical series is essentially unclear. The materialist cannot allow the mental series to be independent of the physical series; for this would be to abandon his monism and surrender his own theory. No more can he allow the mind to be a real and active something; for this also is contrary to the hypothesis. In some way the mental series must be made to depend on the physical series; and this can be done only by teaching the materiality of thought, or by making thought a powerless attendant upon the physical series.

The latter course is the one generally adopted. The physical series is viewed as going on by itself, and as subject only to the laws of force and motion; and the mental series is simply the subjective shadow which the physical series casts. As such it contributes nothing and subtracts nothing. A shadow effects nothing; and, in turn, no energy is expended in making it. The physical series is not affected from without, and nothing is drawn off from it to make thoughts and feelings. Hence, the presence and movement of the mental series are determined by the physical series, just as the presence, form, and movement of a shadow are determined by the body which casts it. The existence of any thought or feeling is due to the general form of nervous action. The existence of this or that particular thought or feeling is due to specific peculiarities of nervous action within the limits prescribed by the general form.

The powerlessness of the mental series has been sharply stated by Professor Huxley in his lecture "On the Hypothesis that Animals are Automata," where he says that he knows of no reason for believing that any mental state can affect any physical state, and adds, "It follows that, to take an extreme illustration, the feeling we call volition is not the cause of a voluntary act, but the symbol of that state of the brain which is the immediate cause of that act." The general view has been wrought out at great length by Mr. Spencer in his "Principles of Psychology," where, along with many bewildering remarks about opposite faces of the unknowable, he represents the mental face as completely determined by the physical face, so that memory, reflection, reasoning, and consciousness in general are only the subjective shadows of molecular changes in the brain, or of what he calls nascent motor excitations. Mental movement of every sort is due, not to any self-determination of reason, but to the nervous mechanism; and this, in turn, is subject

only to the laws of molecular mechanics. The coexistence of ideas means the coexistence of the appropriate nervous states. The comparison of ideas means the interaction of these states. A conclusion, or a choice, means that one nervous set has displaced another nervous set. The processes of logic represent no fixed and necessary order of reason, but only the subjective side of a conflict among nervous states. A conclusion actually reached, or a view actually held, represents no fixed truth, but only the superior strength of the corresponding nervous combination. Truth in any case is only a nervous resultant, and depends upon the nerves. We now inquire into the bearing of this view on knowledge.

We point out in the first place that we reach the thing-series only through the thought-series. We know that there are things and what they are only through thought. Hence, while the thing-series may be first and fundamental in the order of fact, in the order of knowledge the thought-series is first. A first question, then, would be, What warrant is there for affirming any thing-series? Why may not the thing-series be after all only a phase of the thought-series? From Hume to Spencer, the thing-series has been defined as a series of vivid states of consciousness, while the ego is a series of faint states of consciousness. But, vivid or faint, this definition makes both subject and object states of consciousness; and, hence, both belong to the thought-series. The ego, as a series of states of consciousness, can lead to nothing beyond itself; and the object, as a series of conscious states, exists only in thought. Here is the place where materialism always tumbles into nihilistic idealism whenever it attempts to reason out a theory of perception. It is well known that Spencer, at this point, when his theory was about to collapse into nihilism, saved himself by reinstating the ego as a true agent. In his argument with the

idealist the ego acquires a new character. It is no longer a series of faint impressions, or the inner side of nerve-motions, but a true source of energy; and the warrant for affirming a thing-series, apart from the thought-series, is found in the fact that our energy is resisted by an energy not our own. This is excellent doctrine, but it does not agree with the other doctrine, that the ego is only the sum of mental states, and that mental states affect no physical states; for it makes our own consciousness of effort and energy the turning-point of the entire debate between the nihilist and the realist. It saves realism by surrendering materialism; and nihilism can be escaped in no other way.

We pass to another point. All arguments for the sufficiency of matter assume a valid knowledge of matter. That X is adequate or inadequate is a proposition which admits of no discussion. It is, then, a matter of interest to know what warrant there is for affirming that the thought-series rightly represents the thing-series. The general fact that the latter determines the former in no way implies that the latter must determine the former so as to correspond with itself. If an organism be able to generate thoughts, it by no means follows that the thoughts must represent external reality. The thoughts might be as subjective as the fancies produced in dreams. One would expect that the thoughts would represent, if anything, the organic processes of which they are said to be the inner face; whereas they never refer to these, and commonly refer to things entirely apart from the organism. Nervous combinations and movements are said to have ideas for their mental face; and the natural thought would be that those ideas would be ideas of their peculiar nervous correlates. But this is never the case; indeed, that there are such correlates is even now a matter of not very cogent inference. This complete silence of the organism as to what is going on in itself, and the report in-

stead of what is taking place in the outer world, are very remarkable facts. Certainly, when matter is declared to be a double-faced entity we should expect to find the mental face reflecting that part of the physical face which attends it, or which is next to it; but the mental face never reflects the physical series which produces it, but some other and unconnected series. Thus a set of rays of light fall upon the body and a thought results, but not a thought of the nerve-processes, or molecular motions which produce the thought, but a thought of some external luminous object. It is strange, indeed, that anything should result, but that the thought should be a reproduction of the object is surprising in a far higher degree. The wonder is still greater in our perception of others' thoughts. Here some waves of air fall upon the ear, and at once the nerves produce thoughts with the added assurance that they are the reproduction of a thought-series which exists apart from our own.

We can now understand the problem. If knowledge is to be possible, the mental series must rightly represent the physical series and all other mental series; but what ground is there for affirming that they must correspond? And for the materialist there is no answer except in some debased form of the pre-established harmony. He must assume not only that matter in general is capable of generating thoughts, but that it is shut up by its nature to the generation of thoughts which correspond to the outward fact. He must even assume that bodies are so related to the universe as to be under obligation to generate correct thoughts about things in general. Leibnitz found some reason for the harmony in the fact of its pre-establishment; but the materialist has simply to assert it as an opaque fact.

Still the problem has not been entirely unnoticed. Notably Mr. Spencer has sought to account for the harmony in question by a theory framed from natural selection and

heredity. According to this view, there is no original need that matter should think rightly; but if any organism should think wrongly, it would soon collide with reality and perish. Right thinking, therefore, is necessary to continued existence. Natural selection must tend to pick out the sound thinkers from the unsound; and by heredity their tendencies will be integrated and transmitted. The final result will be that thought will at last be adjusted to things, yet without any reference to an opaque and uncaused harmony.

The ingenuity of this view is wonderful; still more so is the uncritical faith which can receive it. For since thought has no effect on physical processes, it is hard to see what effect for good or evil thought can have. The survival of the organism is a purely physical matter, with which, by hypothesis, thought has nothing to do. There seems to be here a trace of the antiquated notion of self-control, according to which our knowledge determines our course. In a system of freedom the theory would have application; but when thought is only the powerless shadow of reality, its misadjustment is insignificant. In this theory, the destruction of the organism is not due to a maladjustment of thought, but to a maladjustment of the organism. The organisms which perish are not those which think wrongly, but those which cannot maintain their equilibrium with the environment. But there is nothing in this which implies that those organisms which are in equilibrium with the environment must produce true thoughts of the environment. The crystal maintains itself against its surroundings by virtue of its physical structure; but it does not follow that if a crystal should have thoughts they must reflect the surroundings. But why should the same equilibrium imply more in the organism? Why must organisms which can physically maintain themselves think rightly about their surroundings? This they must do if knowledge is to have

any validity; but it is hard to find any reason for it. We are forced either to abandon knowledge or else to fall back again on a grotesque harmony between organisms and their surroundings, such that when they take to thinking they can but reflect their environment. But this is Leibnitz's theory of pre-established harmony in its most debased form. Leibnitz was not content to affirm the harmony between mind and its objects; he explained it by its pre-establishment. Materialism degrades it to a physical significance and leaves it unaccountable.

Again, it is very remarkable that the narrow range of the Spencerian principle should have been overlooked. If it were true, it would provide for valid thoughts only as they are related to survival; whereas the bulk of our thoughts have no bearing on survival. A mistake in our theory of double stars or in solar physics would not be attended with any physical disaster. The true theory and the false theory are equally without significance for survival. And since this is the case with the mass of our alleged knowledge, the action of natural selection can never come into play to separate the true from the false. What warrant, then, have we for trusting the report of thought on these things? The uninitiated may be tempted to think that we reach these things by reasoning; but on this theory, reasoning itself is only a function of the nerves. It is but the subjective side of the nervous mechanism; and there is no assignable reason why the nerves should reason more accurately than they perceive. If reasoning were an independent mental activity, self-poised and self-verifying, the case would be different; but the mind is only the sum of mental phenomena; and these phenomena are called up and shifted by the nervous mechanism. Once more, then, what warrant is there for trusting our nerves? That they should produce thoughts about everything is very remarkable; but that these thoughts

should represent the reality is in the highest degree surprising. The mental series, which originally was the subjective face of sundry nervous movements, turns out to be the inner face of all physical series or movements, with the one amazing exception of the physical series on which it depends. To retain our trust in knowledge, we must make once more the assumption of a pre-established harmony in its worst form. Who would have expected to find the ghost of Leibnitz, in a somewhat degraded state, lurking among the ponderous phrases of the Spencerian philosophy.

We see, then, that natural selection, as a principle of belief, does not escape the admission of an uncaused harmony between the body and the environment. We next point out a peculiar difficulty which arises from this principle, if we allow it to be valid. It follows directly from it that no belief can become wide-spread which is contrary to reality; for maladjusted beliefs must lead to collision with the nature of things and consequent destruction. It further follows that every widespread and enduring belief must correspond to the nature of things. Certainly those beliefs which originated in the earliest times, and which have maintained themselves ever since, must be viewed as having far higher probability than the late opinions of a sect. The great catholic convictions of the race represent the sifting action of the universe from the beginning. They are, therefore, the only ones which, on the theory, can lay the slightest claim to our acceptance. It is, then, in the highest degree inconsistent when the disciples of this view reject a belief because it is old and reaches back to the infancy of the race; for this is the very characteristic of true beliefs. A belief which has only recently appeared can hardly lay any claim to be considered at all. What, then, shall we do with such beliefs as the belief in God, freedom, the spirituality and immortality of the soul, and the existence of a

moral government in the universe? Of course, as materialists, we cannot accept them; but how can we as materialists reject them? The same brain which has ground out the truths of materialism has also ground out these other notions. That they are not fatally maladjusted to the nature of things is proved by their continued existence; and, by hypothesis, they are products of that natural selection whose especial business it is to sift the true from the false. There is nothing to do but to attempt a distinction between maladjusted thoughts which lead to destruction and others which do not. Our thoughts of God and supersensible things are of the nature of dreams. They lie outside of any possible physical experience, and hence they cannot collide with reality any more than could a ghost. Unfortunately, it is not easy to draw this line so as to conserve those physical truths which lie outside of any possible experience, and at the same time put religious and other obnoxious ideas to flight. It is a very grave circumstance that matter should be so given to dream and error. Of course, the uninitiated will think that reasoning will serve our purpose; but reasoning itself is a part of the nerve-process.

Throughout the past, natural selection has favored anti-materialistic views; in the future the same process must eliminate materialism. It is plain that those beliefs which make most of the person and which give one most energy and hope must in the long run have an advantage over others which are relatively discouraging and depressing. Hence, in the end, beliefs which tend to righteousness and cheerfulness must overcome all beliefs which tend to looseness and despair. The former will tend to conserve the physical and moral health both of the person and of society, and the latter will be in alliance with destruction. If it be said that we here forget our previous assumption that a

mental state cannot affect a physical state, we reply that that assumption is not our own, but the theorist's. We do not assume any responsibility for any of these views; we inquire merely into their implications. And since the theorist has introduced natural selection as a determining principle of belief, we inquire whither it will carry us. That this principle does not agree with the other principle, that the physical series goes along by itself, is not our affair. And even if the two did agree, it would be highly unscientific to hold that a change of opinion will have no effect on action. As opinion, of course it would be powerless, but as opinions are only the subjective side of nervous states, it follows that a change of opinion points to a change in the nervous processes, and hence it must lead to change of action. Now, as a matter of fact, the belief in God, immortality, and moral government, has a great value both for personal and social well-being. It is the great source of courage, hope, cheerfulness, and steadfastness in righteousness. And, on the other hand, it is undoubted that materialism, atheism, etc., are relatively depressing and demoralizing. The rapid spread of pessimism among the more earnest of the advanced thinkers is sufficient proof of this. Hence, under the operation of natural selection, the former set of beliefs will have a decided advantage over the latter, and in the end they must conquer. That matter can form the conception of freedom, the soul, and God we know by the fact; hence, they are plainly not repugnant to the nature of matter. The direction which its future thinking must take under the influence of natural selection is plain. Matter must come at last to a firm faith in the soul, immortality, and God. Of course, the eager objector, carried away by his nerves, urges that believing them would not make them true, but only cherished delusions. It is odd how hard it is for one to master his own theory. By hypothesis, matter is

capable of valid thinking; and why should we not trust it when it thinks about God as well as when it thinks about the world? We do not insist that it is equally trustworthy; we only ask for some standard whereby one set of thoughts can be ruled out, while another is retained. Of course, we are beyond the point where we fancied that reason itself is such a standard; for reasoning is a part of the nerve-process. It does not contain any standard of truth in itself, but comes and goes according to the principles of nerve-mechanics.

As materialists, then, we are shut up to the doctrine of an opaque harmony between thought and thing. But while this doctrine is necessary to save knowledge from one danger, it exposes it to another equally great. The theory calls for the most exact and consistent knowledge; and unfortunately we have no such knowledge. How, then, are we to decide between opposing views? The most natural assumption would be that those views are most likely to be true which matter produces most freely; but, sadly enough, the average brain is not so made as to grind out materialism and atheism. Matter in its thinking has a strong tendency towards theism, morality, and the spiritual conception of the soul; and it has even devoted much attention in the past to theology and metaphysics. Of course, these views are false, but how are we to escape them? If the human mind were something which is capable of free reflection, and which develops variously according to its circumstances, we might account for much variation by the mental environment; but, of course, this is not the case. It is indifferent to a molecule where it is, and it ought to be indifferent to any complex of molecules. In particular, it is hard to see how the organism can be affected by its mental atmosphere. Prejudice and superstition might influence minds; but they do not seem adequate to influence material movements. Be-

sides, if they could, they are themselves the outcome of material activity. If there be prejudice, superstition, and stupidity in the world, matter is to blame for it. It is matter that hath made both us and our opinions, and not we ourselves. If, then, there could be any distinction between reason and unreason in this system, we should be forced to allow that, along with a little right thinking, matter has done a vast deal of wrong thinking. It has an inherent tendency to irrationality and falsehood. It is the sole source of theologies, superstitions, and anthropomorphisms, as well as of the sun-clear truths of advanced science. If we were persons with faculties which could be carelessly used or wilfully misused, these things might be laid to the charge of individual carelessness or stupidity or dishonesty; but as we are not such persons, all these things must be charged to matter itself. This conclusion remains if we call matter the unknowable, the mysterious one, or anything else which may strike our fancy. In every system, of necessity we have to posit in being, along with reason, a strong tendency to unreason, which throws discredit on all knowledge. According to the materialist himself, for one sound opinion matter has produced a myriad unsound and grotesque ones.

But even yet we have no ground for distinguishing the rational from the irrational. In the old philosophy the distinction between a rational and an irrational belief is, that the former rests on grounds which justify it, while the latter is groundless. But materialism cancels this distinction entirely, and reduces all beliefs to effects in us. It recognizes production only, and allows of no deduction. All our beliefs are explained by their causes, and none have any rational advantage over any other. The only distinction is of relative extent; and the only standard possible, unless we yield to pure ipsedixitism, is to take a vote and view rational beliefs as those which are most widespread and en-

during. But even this is impossible. In raising the question how to decide between opposing beliefs we have implicitly assumed that reasoning is possible, and that we have power over our beliefs. In discussing the problem of error we pointed out that rationality and the distinction between truth and error are possible only in the fact of freedom. Where there is no freedom, there is no reason. So far from having power over our beliefs, we are our beliefs, and they are determined solely by the nerves. If there were any reason left, the only conclusion it could draw would be that one belief is as good as another as long as it lasts. The actual is all, and any rational distinction between true and false vanishes.

Thus we have traced the materialistic theory of knowledge to its outcome, and the outcome is overwhelming scepticism. The theory can lay no claim to be either scientific or philosophic, because it makes both science and philosophy impossible. Looking at the world with materialistic eyes, we see a necessary kaleidoscopic process. Parts of the process are attended by thoughts, partly true, but mostly false. All of these thoughts which collide with materialism are known to be false, not by reasoning, but by hypothesis. Throughout the world-process there is a strong and almost overwhelming tendency to dream and falsehood; and, but for certain advanced thoughts, error would have reigned supreme. We say advanced thoughts, for, by hypothesis, thinkers do not exist. Looking at human life and action, we see pure automatism. The action of men and women may be attended with thought and feeling; but from the beginning it has taken place without any intervention of thought and feeling; for there is no reason for believing that any mental state can affect any physical state. Even the materialist's thought and purpose count for nothing in the exposition and publication of his philosophy. By his

own theory all that has ever been done in this direction has taken place without any control or guidance of thought—a statement which is the most credible of the materialist's many utterances. Indeed, this statement throws light on many of the homilies from this quarter. It has long been a puzzle to the critical mind how any rational being could produce some things which have appeared from materialistic speculators. But now we see that reason had nothing to do with their production, and the wonder rather becomes that the nerves should do so well.

Thus the metaphysics, the psychology and the epistemology of materialism appear equally superficial or self-destructive. It is properly a philosophical superstition rather than a philosophical doctrine, for a certain measure of rationality is necessary to constitute a doctrine. All that is needed to dispose of it is to understand it, and it vanishes of itself.

And where in the meantime is the soul. Spatially, it is nowhere, having neither form nor spatial relations. Actually, however, it is the self that thinks and feels and wills, and in this activity experiences and knows itself as the active and abiding subject of this inner life. It is not something which can be sensuously presented; it is what we all experience as ourselves. It is not a sense object, it is the living subject in unchangeable antithesis to all sense objects. It is not an object, it is the subject which is the condition of all objects. Through oversight of this fact, the materialist always seeks to find the subject among its objects, where in the nature of the case it never can be. He likewise seeks to construe the subject in the forms of spatial objects, and this leads to absurdity. He looks for the subject in the wrong place, and failing to find it, concludes that it does not exist. But mind, as the knowing subject, can never be found among its external objects. In this respect,

it is like vision, which gives us all objects, but never gives us itself. And the materialist who concludes to its non-existence is like a physiologist who should so lose himself among the objects of vision as to forget, or even deny, that there must be an eye in order to vision. The mind is the eye, which sees, and, of course, cannot be found among the things seen. But this the monist incessantly forgets, and, after he has looked through the list of objects which the mind has given him without finding the knower among them, he forthwith proceeds to deny the knower. If, in addition, he has looked carefully through the brain, and caught no glimpse of the mind, he becomes fixed in his denial. Thus the order of fact is inverted. The real is made phenomenal, and the phenomenal is viewed as real. Of all the extraordinary delusions which have ever possessed the human mind, this is the most extraordinary. Overlooking the necessarily antithetical nature of subject and object, the subject looks for himself among the objects, and, confounded by the failure to find anything, overlooks and denies himself entirely. The knowing self—which is the primal reality in knowledge, and the only reality of which we have proper consciousness—is denied, because it will not consent to become a phenomenon, although, in the nature of the case, it never can do so.

As against materialism, the affirmation of the soul as the active and abiding subject of the mental life must stand. The case of spiritualism *versus* materialism must be declared closed and a verdict given for the former. But some more subtle difficulties arise from the side of epistemology and metaphysics; and these we have next to consider. These, however, have no tendency to establish materialism, but rather to dissolve the soul away into a phenomenal and metaphysical haze of a pantheistic type. This is another

doctrine altogether from the traditional materialism which explains the mental life by the combination and interaction of physical agents.

And first it is said that this doctrine of the soul, though true for phenomena, is not true for noumena. The self as it appears is indeed the unitary subject of the mental life, but this fact allows no conclusion as to the unity of the noumenal self.

A first remark in reply would be that if the unity of the self in experience does not warrant us in concluding to its substantial unity, still less does it warrant us in concluding to its composition. A thing must always be allowed to be what it seems unless reasons can be given for going behind the appearance. But the true answer to the objection lies in a fact dwelt upon in the Introduction. We there saw that the question, What is being? reduces always to this other, How must we think about being? The self as we know it is the only self there is to know; and the only question which can arise concerning it is, How must we think of it? We insist that in the face of all the facts we must think of it as one and not many, as simple and not compound. Objections to this conclusion must take the form of showing that the facts can be otherwise interpreted in articulate thought. Objections based on the phenomenality of human thought rest at bottom on the crude fancy that there may be some form of thought which can grasp reality otherwise than by thinking of it, and on the further superstition of extra-mental reality.

This style of objection dates back to Kant; and since his time certain speculators have given themselves an air of great profundity by speaking of the empirical, or phenomenal, and the noumenal ego. In order to carry through his phenomenalism of thought and knowledge, Kant denied the possibility of concluding from the unity of the ego in con-

sciousness to its unity in being, alleging that if such a conclusion were allowed, it would overturn his entire criticism. But this reason was purely personal, and has no value in logic. Indeed Kant's regard for his system led him to use extremely feeble arguments in his criticism of rational psychology. He insists strongly on the unity of the empirical ego and on the "synthetic unity of apperception" as a necessary condition of consciousness; but he disputes the speculative conclusion that the transcendental ego must be a numerical unity.

Unfortunately, the nature of this empirical ego, and its relation to the transcendental ego, are left very unclear. If we say that the empirical ego is the form under which the noumenal subject appears, the question at once arises, To whom does the empirical ego appear, and what recognizes the appearance? There can be no appearance without something which appears and something to which it appears. If the ego is the appearance, what is the ego which perceives it? If it be said that the empirical ego is but the aggregate of conscious mental states, we must know the subject of these mental states. It cannot be the empirical ego, for that is the states themselves; and it would be quite absurd to speak of an aggregate of states as its own subject. If we should push these questions, it would at last appear that the transcendental ego is not something lying beyond all consciousness and knowledge, but is simply that abiding self revealed in consciousness and thought as one. Besides, the unity of the ego is not affirmed because we appear to ourselves as units, but because we appear to ourselves at all. The unity of the true ego is necessary to the existence of any mental life.

But, says Kant, the unity and identity of the subject does not prove the unity and identity of the substance. He nowhere attempts to show how an aggregate can give rise to

a unitary consciousness; but he uses an illustration to show how identity of the subject might be combined with non-identity of the substance. When an elastic ball strikes another of equal mass, the motion of the former is transferred to the latter. He speaks of this as one body transferring its state to another. In the same way, he suggests, a mental substance might transfer its entire consciousness to another. The consciousness being thus passed along from one to another, the subject would remain identical, while the substance would be incessantly changing. Kant was doubtless led to this strange notion by his anxiety to ward off all attempts at ontological knowledge; but whatever its ground, and however great Kant's genius, this is certainly a case where good Homer nods. For, in the first place, states are incapable of transfer except in a figurative sense. The moving ball does not transfer its motion, but sets another ball in motion. Kant adopts here the crudest possible conception of inherence, and speaks as if states, or attributes, could be loosened from their subject and transferred bodily to something else. The subject appears as the bearer of properties instead of the agent which, by its activity, founds properties. Hence the idea of a bodily transfer. This notion we have transcended. The only possible conception of his illustration would be that one substance might by its action on another cause that other to assume a mental state like its own, so that it should seem to itself to have had a past experience when it had not had it.

But this notion of a transmitted consciousness is a gratuitous violation of appearances instead of their explanation. Moreover, it fails to do what it is invented for. For, in the case supposed, there would not be a single and identical mental life, but a number of similar mental lives, each of which has its unitary subject. There would be much that is magical in such a view; but the point in dispute, the

unity of the being, is admitted. If, however, the mental subject, the conscious, active ego, is passed along, it would by hypothesis be the same mental subject after all. The ego, the personality, would not change, but only the unknown and inactive substance. But this substance is a myth. Here appears a crude notion of substance in Kant's view. He views it as a mysterious substratum, whereas substance and subject, or agent, are identical. We have repudiated the substratum-notion as the product of sense-bondage. That which can act and be acted upon is the essential idea of substance. When, then, we have found the mental subject, we have found the mental substance, for subject and substance are identical. Kant's admission of the necessary unity of the mental subject is all we ask. The mental subject is all we recognize. We admit no substance behind the subject and outside of knowledge. The ego which thinks, feels, and acts is all there is to know; and for us the fact that the ego knows itself as the subject of its acts, and as one in the unity of its consciousness, together with the further fact that this unity appears on reflection as the absolute postulate of the mental life, is the highest possible proof of its unity and reality. We must repeat the conclusion reached in our ontological studies, that a thing is to be viewed as real and substantial not because it has a kernel of substance in itself, but because it is able to assert itself in activity. Things do not have being or substance, but they act, and by virtue of this activity they acquire the right to be considered as existing. In like manner the soul has no being in it; but it knows itself as active and as acted upon; and in this fact and knowledge it has the only possible mark of reality.

Finally, we mention the argument based upon Kant's phenomenalism. The self as object of knowledge must come under the conditions of knowledge; and by so doing

it must become a phenomenon. Our self-knowledge, therefore, only reveals the phenomenal self, or the self as we appear to ourselves, and never the noumenal subject, or the self as it really is. Whether any one was ever convinced by this argument may be doubted; at any rate, no one ought to have been convinced by it. As to the possibility of self-knowledge, experience only can decide. We have no knowledge of any sort which can deal with this problem apart from experience. The application of the categories to the knowledge of self does not make it fictitious. In treating of scepticism we have seen that a thorough-going doctrine of relativity cancels noumena altogether. They must either consent to be known, or go out of existence. There is a real as well as a formal application of the categories. In the case of physical phenomena the application is formal; in the case of the soul it is real. The soul itself as object of knowledge does come under the categories; but it does not come under them as abstract principles imposed from without, but as the living principles of intelligence itself, revealed and understood in experience. Without this admission, the transcendental ego vanishes from thought altogether; and with it we have valid knowledge.

But now we come upon some more subtle speculative suggestions which constitute real difficulties in the doctrine of the soul. These have nothing in common with the crude fancies of materialism, but come from the depths of metaphysics.

And first, it may be asked, what have we won in calling the soul real and abiding? Is not the experienced life, the stream of thought and feeling, the main thing after all; and is not this just as good without metaphysics as with it?

The underlying question here concerns the application of the categories of being and identity to the soul; and the

suggestion is that in any case they are barren, and that the stream of thought itself is all we can find, and all we need to find. We consider the two categories in order.

In reflecting on this subject with any precision one begins to realize how imperfect language is as an instrument of expression, when abstract matters are under discussion. And we need to bear in mind not only what we may mean by our terms, but also what others will understand them to mean. Now in calling a thing real, common-sense means to affirm that the thing is not an illusion, a fiction, a phantom of an ignorant or disordered intelligence, but is something which acts or is acted upon, and thus appears as a veritable factor in the actual ongoing of the world. And from this point of view, what we mean by calling the soul real is just what we mean by calling anything real, namely, that it acts and is acted upon, and that it is a determining factor in the world of change and effects. And what we gain by calling the soul real in this sense is double. First, negatively, we rescue the soul from the position of a fiction or hallucination. Second, positively, we satisfy the rational demand for a sufficient reason for the mental life, we supply the unity without which the thought life falls asunder, and we secure some ground for the conviction of responsibility on which society is based. To call the soul unreal involves failure in all these respects, and carries both theoretical and practical demoralization with it. This from the stand-point of popular speech.

It is also to be noted that whatever difficulty there may be in the notion of reality it emerges at least no less when applied to matter than when applied to mind. Indeed we have abundantly seen that the category of causal reality cannot be applied to matter without contradiction. The notion breaks up and vanishes under criticism; and the soul is the only thing which fills out the notion of reality. Hence

no one who admits the reality of matter ought to have the least difficulty in admitting the reality of the soul; for the evidence in favor of the reality of the soul is indefinitely stronger than that for the reality of matter. And it fills one, first with astonishment and then with compassion, to find persons objecting to the reality of the soul as a useless or groundless metaphysical doctrine, while admitting all sorts of physical metaphysics as undeniable first principles. What wonder that with such blind leaders of the blind we fall into the ditch of "mind-stuff" and similar infantilities.

If, then, we question the reality of the soul, we ought to have it clearly understood that we do not mean thereby that it is a fiction, or that it cannot act or be acted upon, or that it is relatively unreal in comparison with matter, but only that it is unreal in comparison with some absolute reality. This only, we may say, truly is. All other things are comprehended in an order of becoming, and hence are relatively shadows and vanishing. But such doctrine moves over the head of common-sense altogether; and criticism must never fail to remind us that, however true it may be, it does not remove the fact that we still are real in the sense that we can act and be acted upon, and may be held responsible for our actions.

But it is probable that the objections to regarding the soul as real, so far as they do not spring from crude materialism, are not due to these high considerations regarding the relation of the finite to the infinite, but rather to a kind of lumpish notion of reality itself. There seems to be a fancy that an agent is constituted real by the category, and that this category might conceivably be discovered in the agent, if the light were strong enough. A little reflection shows the artificial and mechanical nature of such a notion; and reality is ruled out as a useless fiction. How completely this inverts the true order is plain to us. The soul is not

constituted real by a category located within; but it acts and thus acquires the only possible claim to be considered real. The reality of the soul consists in its ability to act; other reality it has none. How the soul can act there is no telling. In thinking of the soul we must not look for a lump, nor for a category, nor for a picture, but for the agent which thinks and feels and wills, and knows itself in so doing. And this soul is neither in the heights nor in the depths; it is very nigh indeed, for it is simply the living self.

Much the same line of thought must be repeated concerning the soul's identity. For common-sense, identity, as applied to things, means simply numerical identity, or that the present being is continuous with the past being. The being A has not disappeared and another, B, numerically distinct from A, has not taken its place. Such a solution of identity would make thought impossible. The soul, then, is real and abiding or identical.

But in discussing the problem of change we found unsuspected obscurities and perplexities in this notion of identity. We seemed compelled to admit some species of continuity in the successive stages of things, but identity seemed provided for only in consciousness. Recalling this result we might argue as follows:

After all, the identity must lie in consciousness or the stream of thought itself; for if we conceive this lacking, the remaining identity is a barren if not a meaningless thing. Consciousness not merely reveals, but makes, the only identity worth talking about. Further, there is no way of seeing how the soul as bare substance could ever provide for the identity of consciousness. And now that we have done away with the soul as lump or inert substance, what remains but to say that the stream of thought is all?

There is something to this, but we are not completely car-

ried along. The argument seems to rest on an improper logical disjunction. In any logical judgment the subject is not the subject except as modified by the predicate. If I say the rose is red, it is not every rose which can be the subject but only the red rose; and in any particular case only the particular red rose in question. So the subject of consciousness is not the soul, considered as blank substance or blank subject, but the conscious soul; and the thing which is identical is neither consciousness in abstraction from the soul, nor the soul in abstraction from consciousness, but the conscious soul. The thought has this dual aspect and cannot be completed without embracing both. Abstract subjects and abstract predicates are logical fictions, and we must not allow ourselves to be deceived by them.

If, however, we are not satisfied with this, and still insist on finding the identity in consciousness alone, we reach the same result in another way. For consciousness as a succession of particular states is not identical or even possible. The successive states are all perishing existences and are all mutually other and external. That stream of thought is in the same case. It is a stream only for that which is not a stream. Hence the consciousness in which identity resides is not the particular states nor the flowing stream, but something continuous and active. It must comprise the states in its own unity; it must distinguish itself from them as their abiding subject, and must work them over into the forms of intelligence. Thus it becomes only another name for the soul itself.

And here, as in the case of reality, the objector is tacitly under the influence of a crude notion of identity. He supposes that there is a category of identity whereby the soul is enabled to be or become identical. But this also inverts the true order. We have seen that intelligence cannot be understood through the categories, but that the categories

must be understood through intelligence. Active intelligence is the only illustration of the concrete meaning of the metaphysical categories. Hence if we would know what concrete identity is we must not look about for an abstract category to tell us, but must rather consider the self-identifying action of intelligence. There is no other real identity; and indeed, closely considered, real identity has no other meaning than that which emerges in the self-identification of intelligence.

But what of the soul when it is unconscious? Is it not the same soul after a season of unconsciousness that it was before; and is there not therefore some identity of being which is quite independent of self-identification in consciousness?

Before it was the metaphysical doubter who spoke; now it is the metaphysical realist. The former sought to find the identity in the flowing consciousness; the latter seeks it in some back-lying substance. If sameness can endure across unconsciousness, then consciousness does not constitute sameness. If unconsciousness continued, and consciousness never returned, we might, indeed, be at a loss to tell what the sameness would amount to, or in what it would consist; but since the same being has pauses of consciousness in the identity of his existence, we clearly see that consciousness is not the seat of identity.

This question takes us into the depths, and a completely satisfactory answer is hard to find. The matter is complicated with the dependence of the finite and the relativity of time also; and the answer must be given in sections.

We may first point out that this question assumes that things exist in a real time, which is not the case. There is no time in which things exist; neither is there any absolute time to which all existence is to be referred. Time is relative to self-consciousness, and not conversely. The fact al-

leged means simply a fault in the self-consciousness of one being judged by the self-consciousness of another being, or by conceived possibilities of consciousness. We might, then, offer this relativity of time as vacating the inference from the alleged fact.

But this is a dark saying for all but the very elect, and only few can hear it. Let us fall back, then, on our distinction between continuity and identity, and say that continuity of being might conceivably abide across periods of unconsciousness, but that only consciousness can raise continuity to identity. This continuity is what common-sense means by identity, and it cannot be denied without dissolving the mental life away into a magical phantasmagoria.

So much may be affirmed with all conviction, but if we ask in what this continuity consists we begin again to grope. Many will find no difficulty. The same thing just exists, and no more need be said about it. But for us who have done away with rigid lumps and changeless cores and abstract identities, this naïve solution is impossible; and there seems to be no way out except to fall back upon some notions which began to dawn upon us when treating of interaction and the relation of the finite to the infinite. We there saw that no finite thing has its existence in itself. A finite thing has its existence only in dependence on the infinite, and in relation to other members of the system. It is then a dependent and relative, and, so to speak, only a partial existence. The full and complete notion of existence is realized only in the absolute and infinite intelligence. All other existence is partial and incomplete.

When we are dealing with the world of things we discover that they have existence only for others. To some extent they exist for us; but they have their essential existence for God. And for him their existence consists in the idea they express and in the activity in which the idea

finds expression. The identity of the idea is the identity of the thing; and the continuity of the activity of expression is the continuity of the thing. As having existence for others, they are real in one way. As having no existence for themselves, they are unreal in one way; that is, they have only phenomenal existence.

Something of this double aspect appears in our own existence. We have to distinguish our existence for ourselves from our existence for others. The soul has its existence primarily in the divine thought and act, and it may remain on the plane of existence for others without at once attaining to, or always possessing, existence for itself. Apart from the latter the soul has its existence and continuity solely in the divine thought and will. However mysterious this result may be, it seems to be the conclusion to which we are shut up. How that which begins without selfhood and in absolute dependence can yet attain to selfhood and a measure of independence is the mystery of finite existence.

If it be said that on this view the true existence of the soul, its existence for self, is a discontinuous thing, and hence without any but a magical identity, the answer is found in what we have already said. The objection assumes, first, a real time, and, secondly, that we have some real notion of identity other than what we experience. Both assumptions are false. There is no real time in which the unpicturable pauses of finite existence occur, and we have no proper notion of concrete identity by which to determine whether experienced identity be genuine or not. We form the notion of abstract metaphysical identity by conceiving continuous existence through real time; and any solution of continuity is held to destroy identity. But this notion has no application when time is made phenomenal. Then experienced identity is the only identity, and of course the only test of identity. The self-identification of the soul,

then, is the best proof of identity, for identity has no other meaning. Whatever may lie beyond this must be sought not in the realm of metaphysical abstractions, but in the thought and self-consciousness of the infinite.

After these long wanderings through the dry places of metaphysics, it may be well to rest ourselves by taking an account of stock, so as to see where we stand, or where we think we stand. We do so in the form of question and answer.

1. Can the mental life be deduced from physical organization?

No. All that takes place in the organism can be reduced to some form of movement and grouping of the physical elements; and no reflection on such movement and grouping will ever reveal thought and feeling as an analytical consequence. Moreover, all physical causation consists in producing new movements and groupings of the elements. Antecedent movements and groups are the cause; consequent movements and groups are the effect. Hence thought, which is not a physical movement or grouping, lies outside of physical causation.

2. Can the mental life be understood without admitting a real something, the self or soul, which cannot be identified with the physical elements, and which is the abiding subject of thought and feeling?

Again, no. Capital facts and the most cogent kind of reasoning unite in enforcing this answer. However mysterious and inscrutable the physical elements may be, the mental life cannot be viewed as a resultant of their interaction. It is, rather, demonstrably impossible without the one and abiding self.

3. May not this self be dispensed with if we suppose matter to be one and duly furnish it with mysterious subjective faces or aspects?

Once more, no. The nature of thought and consciousness necessitates the admission of the one abiding self as their indispensable condition.

4. Can the mental facts be described in terms of their physical attendants or conditions?

Still the answer is, no. The antecedents are some form of molecular grouping and movement; the consequent is a thought or feeling. The latter may be summoned or excited by the former, but it can in no way be expressed or understood in terms of the former. The incommensurability is absolute. We trace the physical series a certain way, and then we reach a fact of another order, a sensation or perception. Facts of the latter kind are known only in and through consciousness, and never through reflection on their antecedents. The two orders are as incommensurable as the letters of a printed page are with the meaning they convey.

Hence physiological psychology presupposes the psychology of introspection. If our aim is to explain the mental facts of course we must first know the facts. Or if the aim is to find the physical attendants or conditions of the mental facts, again we must know the facts. Without this knowledge we have no problem; and without introspection we have not this knowledge. Introspection, then, must observe the facts and classify and formulate them before physiological psychology can begin.

5. Is the mental life dependent on the organism?

This question is unclear. Dependence may be understood in the sense of causal production by the organism or it may mean an order of concomitant variation in the physical and the mental series. In the former sense the mental life is not dependent on the organism. In the latter sense there is mutual dependence of each on the other. There are mental states arising in connection with organic states; and

there are organic states arising in connection with mental states. In this sense the causality works both ways.

But the question is further unclear. It may mean, Could a mental life go on apart from any organism? Could our mental life go on apart from any organism? Could it go on apart from the present organism?

To question one, the answer must be that an absolute mental life would need no organism. To question two, the answer is that the finite spirit, in so far as it is in interaction with other spirits and with the cosmic system, must always need some fixed system for receiving and giving impulses; otherwise it would not be in the world at all. If this means organism then organism is necessary. To question three the answer is that it is easily conceivable that our mental life should go on under other organic conditions. The actual organism is only a stimulus to mental unfolding and a servant of the unfolded life; and there is no difficulty in the thought that this service should be performed in other and better ways. At present, however, the organism is mentally conditioned and the mind is organically conditioned, in the sense of mutual concomitance in their respective changes.

6. Can we learn anything of these conditions?

Without doubt. In a general way we already know much, and it is conceivable that we should know much more. The interdependence of mind and body might be specified into minute details. We know that we see with the eye and not with the ear, while we hear with the ear and not with the fingers. It is conceivable that, in like manner, other mental functions should find their physical attendants located in some specific part of the brain, and not in the brain as a whole. Such a fact, if established, would contain no ground for alarm or even surprise. On the other hand, it is conceivable that growing knowledge

should extend the significance of the mind for the organism far beyond what is at present surmised. In a general way, physicians have long recognized the importance of mental health for physical health; and that a merry heart doeth good like a medicine is a truth of ancient recognition.

Here then is a large and important field of study, to find and fix the facts of the mutual dependence of mind and body. This field belongs to the physician and the physiological psychologist. The only caveat the critic cares to issue is to beware not to take the order of concomitant variation for one of materialistic causation.

At the same time it is plain that this can be done only in a general way. By long and careful pathological study a doctrine of localization might conceivably be proved for various mental functions, and important correlations and concomitances might be discovered between physical and mental pathology. Such facts lie within the range of possible discovery and might be valuable if established. But when we begin to theorize on the molecular structure of the brain and the peculiar molecular structure and functions whereby the brain serves as the organ of thought, then we pass beyond the range of our faculties and lose ourselves in vain imaginings. What takes place in the living brain as the centre of the physical system is only a matter of hypothesis; what takes place in the brain as the organ of thought is a subject of the vaguest surmise. That this is so is manifest upon inspection. Unfortunately, this field has been ravaged by dealers in mind-stuff who think only in physical images, and they have made such fearful and wonderful discoveries that one is at a loss to say which is the more mythological, their psychology or their anatomy and physiology. "Memory-pills" are already advertised; and we may confidently expect the discovery of the thought

microbe, to be followed by the preparation of "cultures" for inoculation.

7. What shall we say of psychology without a soul?

There is no such thing. The phrase is either absurd, or else it is a misleading expression for the following commonplace fact:

It is possible to do detailed work in psychology without in any way going into the metaphysics or the presuppositions of psychology. Detailed studies of the senses, or the general dependence of the mental life on physical conditions, and pretty much all special questions, are of this sort. Such inquiries can be carried on on the general basis of experience without ever asking how experience is possible. It ought, however, to be possible to distinguish between this familiar fact and the denial which the phrase seems to imply. Such phrases are not needed to express either the problem or its solution. The fact of experience is exhausted in the discovery that the mental life has physical processes for its concomitant; and the aim of the wise man must be to find the law of this concomitance, without confusing or distorting the fact by importing materialistic suggestions into it in the guise of figures of speech. The extreme delicacy and sensitiveness of intellectual conscience which finds in the soul an unscientific metaphysical entity would lead us to expect equal caution in assuming physical entities and in using materialistic metaphors. But, as of old, those who strain out the gnat are apt to bolt the camel.

Herewith we close our catechism and our profession of faith concerning the soul in itself.

CHAPTER II

SOUL AND BODY

It may be metaphysical, or anything else disagreeable, but there is no escape from regarding the soul as something substantially real. It abides, acts, and is acted upon; and these are the essential marks of ontological reality. Whatever it may be with respect to the infinite, no other finite thing can show so good a title to the name of reality. In comparison with the body, the soul is the more real of the two; for the former is in perpetual flux, and, as body, it is at best only a more or less constant form of the incessant flow of the physical elements; and these, in turn, are suspected of being only abstract hypostases of phenomena. But this is commonly overlooked. That the body is substantially real common sense never doubts; and even the contemners of metaphysics in psychology are clear as to the metaphysics of body. Finally, from the phenomenal point of view, the body is an important adjunct of the inner life; and we need to get some conception of its meaning and function. Thus we are introduced to a new problem, that concerning the mutual relations of the body and the soul. Our aim is not to go into details, but only to determine the general form both of the problem and of its solution.

Popular thought with its all-embracing category of space has often puzzled itself with questions concerning the mutual space relations of soul and body; and many whimsies

have been entertained concerning the whereabouts of the soul and its location in the body. These questions we pass over as vacated by the phenomenality of space. The interaction of soul and body, however, is a more important problem.

Interaction of Soul and Body

This problem is vaguely conceived in both popular and scientific thought. For the former, space is the supreme category, and all existence is spatial and spatially determined. Hence results a variety of vague fancies respecting the soul as having form, small or great, and as variously located in the body, sometimes filling out the body as a pervasive aura, and sometimes confined to the brain. In popular scientific thought traces of these whimsies are not lacking; and, apart from them, the problem is ambiguously conceived because of the double meaning of interaction itself.

Causation, as we have so often said, may be taken in an inductive and in a metaphysical sense. In the inductive sense interaction means simply the laws of mutual change or of concomitant variation among things. In this sense the interaction of soul and body means only that there is an order of concomitant variation in mental and organic changes; and the inductive problem is to discover the law of these changes.

As thus understood the problem involves no doctrine of causality whatever; and the workers in this field often give out that they eschew all reference to metaphysical efficiency. Commonly, however, they are mistaken. They bring a full line of physical metaphysics with them, which they hold in high esteem; and after they have talked a while it becomes clear that, at least tacitly, they regard the physical order as a substantial and independent fact, while the mental order

is only a secondary and shadowy appendix of the physical. Out of this confused state of mind only further confusion can come; and the inductive problem, which has no alliance with materialism, becomes involved in the imbecilities of that superstition.

From our own metaphysical stand-point the inductive problem is the only one we have to consider. The traditional notions of interaction have been set aside, and the body itself reduced to a phenomenal significance. But there still remains the important field of study to discover the laws of concomitant variation in physical and mental changes, or to find what mental states go with what physical states and what physical states go with what mental states. This is the task of the physiological psychologist. And no one can have any interest in forbidding his work, or in wishing him other than complete success. But nothing is likely to be accomplished except by those who have a competent knowledge of real psychology and of real anatomy and physiology. The picture psychology and hearsay anatomy which have been so prominent in this field have their chief value as sources of educational treatises, rather than of scientific progress.

But in spite of the pretended rejection of metaphysics, this question of the interaction of soul and body is sure to be approached by the rank and file of investigators with full faith in the metaphysics of common-sense. Hence it is worth while to consider the form under which the interaction is to be conceived, assuming the body to be substantially real, or to be an aggregate of substantial realities.

By interaction in that case we could only mean that soul and body affect each other. Indeed the union of the two has no other meaning than this fact of mutual influence. On the most realistic theory there is no other interaction or bond of union than this reciprocal influence.

The imagination has commonly confused the problem by attempting to construe it spatially. The body is conceived as a physical aggregate; and the attempt is made to picture the soul as somewhere within this aggregate, either as a manikin located within the brain and nervous system, or as a pervasive and all-embracing aura. Then the elements of the nervous system are supposed at certain times and places to start aside from the line of the physical resultant of their antecedent states without any visible reason; and by this time the notion breaks down from its own absurdity. The manikin soul is absurd; and the laws of continuity and the conservation of energy are affronted by such a procedure.

Some of these difficulties disappear on grasping the phenomenality of space. On that view we give up the attempt to picture the causal realities of the system. Souls and atoms alike, supposing the latter real, lie among the unpicturable agencies of the system. Shape, size, form, and whereabouts are inadmissible notions when we pass beyond phenomena.

The horror felt at the atoms not moving in a line with the physical resultant is a purely home-made one. The invisible dynamic states of the elements are the forces which determine the resultant; and that some of these states should be in the soul is *apriori* quite as credible as that they should be only in the physical elements, and empirically it is quite as well established. The dogmatic assumption that the physical system is complete in itself, and closed against all modification from without, is the only thing disturbed thereby. And seeing that this assumption implies that our thoughts and volitions have no significance in the direction of our bodies, it deserves to be disturbed on the ground both of experience and of good sense.

The conservation of energy, to which reference has been

made, has been the source of much pathetic blundering at this point. Of course the doctrine, so far as proved, does not forbid us to admit that our thoughts and volitions count in the control of the organism, if the facts point that way. On this matter the wayfaring man can judge as well as the scientists. But some speculators, whose knowledge would seem to be mainly of the hearsay type, have been pleased to erect the doctrine into an absolute necessity which forbids the slightest modification. This is pure delusion and error. Particularly, psychologists who have wished to stand well with physics have fallen into this blunder. And then they have said the oddest things about double-faced somewhats, the complete continuity of the physical series, and the impossibility of modifying it from the mental side. Of course this implies that the body starts, stops, and directs itself, speech and all, without control from thought; and they have given out that we must not think otherwise under penalty of conflicting with science. This illustrates the extremes to which a romantic devotion to misunderstood abstractions can carry a mind of the passive type.

The notion is traditional that the interaction of soul and body is a specially difficult conception. This mistake is partly due to the spatial fancies referred to, and partly to the further fancy that interaction must be by impact. All are alike groundless. Given the conception of interacting members, it is quite impossible to tell *apriori* what states shall arise in A, B, and C under the condition X. They might conceivably be the same, and they might be very different, according to the nature of the subjects.

Oversight of this fact has led to the invention of go-betweens to mediate the interaction of soul and body. That certain motions in the brain should be the cause of sensations in consciousness is thought to involve a break of con-

tinuity too great for belief. Accordingly, the attempt has been made to refine the motions, on the one side, and on the other, to reduce the sensations to a sub-conscious form which should be less unlike their physical ground. This attempt is a product of the imagination, and gives no relief to thought. Allowing the elements to be real agents, their motions are not the cause of sensation; the cause is rather the metaphysical dynamic states of which the motions are the spatial expression. Now why, when certain brain molecules are in the metaphysical state which expresses itself in motion, the soul should pass into the state of conscious sensation is of course mysterious enough; but it is no more so than that a piece of iron should become magnetic when an electric current passes round it. In both cases the mystery of interaction is equally involved; and in both cases the mystery is equally great. Neither the fact nor the order of interaction admits of *apriori* deduction, even on the most realistic theory; neither have we any insight into the possibilities which would make one order antecedently more credible than another. The reason why any order of interaction is as it is must ultimately be sought in the plan of the fundamental reality. The unity of the system cannot consist in the likeness of the interacting members, but rather in their subordination, with all their likenesses or antitheses, to the plan of the whole.

No theory whatever can escape this sharp antithesis of the physical and the mental. It is no special difficulty of spiritualism, but lies with equal or even greater force against materialism. The materialist and the believer in double-faced substances cannot give the slightest reason why a given subjective phase should attend a certain objective phase and not rather some other. It must be affirmed as an opaque fact, or else the reason must be found in the plan of the whole.

This general conclusion must stand. There is, however, some apparent mitigation of the antithesis in the fact of the organism. The interaction of soul and body takes place under the organic form. It is not, then, all physical elements, or the same physical elements always, which interact with the soul, but only those elements which are comprised within the range of an organic activity; thus the organism seems to be a kind of link between the inorganic physical and the mental. As physical, it is allied to the world of matter; and, as living, it is allied to the world of mind. Thus it appears in a measure to mediate the sharp opposition of mind and matter. That thought should attend, or be summoned by, any sort of inorganic physical movements seems something like an affront to the law of continuity, but that thought should attend organic changes impresses us as a much more manageable thesis. And, conversely, that, upon occasion of thought and volition, inorganic physical changes should arise which were not consequents of their physical antecedents would seem to many altogether incredible, who would yet find it quite within the limits of credibility that organic physical changes should result from mental states. The supposed relief here may turn out to be fictitious; nevertheless there is sufficient faith in it, both in popular thought and in current speculation, to make it desirable to examine it. This raises the question what the organism is and how it comes to exist.

The Body as Organism

Still assuming the reality of the physical elements, we have three factors in the problem as a whole: (1) the elements which compose the organism; (2) the cause of their union into an organism; and (3) the subject of the mental life which is manifested in connection with the organism.

The consideration of these points will prepare the way for our final view.

Of course on the realistic physical basis the organism is substantially nothing. It is a highly complex aggregate of physical elements, but if these were removed nothing would remain. Allowing, however, as universally recognized, that we find in the organism factors and processes which are found in the inorganic realm, we must also allow that we find them subordinated to an organic law, so that they build an organism which is as different from the component elements as an architectural structure is more than the unformed material of which it is built. Where shall we find the seat of this law?

First, we may seek to find it in the elements themselves. This leads, as we shall see, to fantastic and grotesque assumptions.

Secondly, we may ascribe it to life, as something distinct from the elements, on the one hand, and from the soul, on the other. This view is not so clear as it seems, nor so useful either.

Thirdly, we may view the soul itself as the ground of form. It has a phase of organic activity and one of conscious activity. Both of these are united as the expression of the nature of the one soul. In this view we should have the following stages:

1. The soul in interaction with the general physical system builds and maintains an organism within certain limits and under certain conditions set by its own nature and the general laws of the system.

2. This organized matter is already within the sphere of the soul's activity as well as under the general physical laws.

3. Hence the organism is partly a physical and partly a psychical function. Its interaction with the extra-organic realm involves the organic activity of the soul; and because

of the unity of the soul it could hardly fail to have significance for the mental activity.

4. Conscious activity based upon and growing out of the organic activity is the final stage. Thus the continuity of the organic and the mental world is in a measure assured and some reason given for their intimate inter-relations.

On the assumed reality of the physical elements, this is the view which offers least resistance to thought. In all complex organisms, whether in the animal or plant world, we should have to assume an organic subject as the ground of form. When these subjects also rise into conscious mental life we have souls.

No one of these views quite agrees with that which our more idealistic metaphysics demands. But before developing this view it seems well to expound more at length the two first views mentioned. Between them they divide the assent of popular thought in this field, and both alike abound in bad logic and crude metaphysics.

Mechanism and Vitalism

There has been a very general demand in recent years that the organism be viewed as a function of its component elements, just as any machine is a function of its parts. As aquosity, it was said, is not needed to explain the water molecule, but only the hydrogen and oxygen which compose it, and as horology is not needed to explain the running of a clock, but only the parts in their actual relations; so vitality is not needed to explain the existence and properties of the organism, but only the component elements with their inherent laws and complex interactions. Vitality is as great a fiction as aquosity or horology. This was called the mechanical view of life and was opposed by the defenders of vitalism.

The mechanical view has often been ambiguously conceived. Sometimes the claim has been made that physics and chemistry explain life, but this was due to logical superficiality. Physics and chemistry explain nothing but themselves, and indeed they explain nothing in any case, being but names for certain orders of phenomena. The elements as doing only what they are found to do in the physical or chemical laboratory could do nothing else, unless we assume other and hidden powers which might be manifested upon occasion. It was this insight which led Professor Tyndall to say that the attempt to explain life by matter as conceived in the inorganic sciences is "absurd, monstrous, and fit only for the intellectual gibbet." Accordingly he proposed to enlarge the notion of matter and endow it with various mystic and subtle properties and potencies.

And this is the form which the mechanical view must take if it is to be held at all. The forces of the elements are only abstractions from the activities of the elements; and the elements do whatever is done. And as the elements in certain relations manifest physical and chemical properties, so in certain other relations they manifest vital properties. But just as the properties of an inorganic atomic or molecular complex depend on the properties of the constituent elements, so the properties of an organic molecular complex depend on the properties of the constituent atoms. The mechanical theory, therefore, can assume a vital force with just the same right as it does a chemical force. Indeed, it must assume both, but both in the same sense. To explain gravitation, it assumes a peculiar endowment of the elements and calls it gravity. To explain chemical action, it assumes another peculiar endowment of the atoms and calls it affinity. So also to explain vital phenomena, it assumes again a peculiar endowment of the elements and calls it vitality. These several *-ities* all stand on the same basis.

They are all alike necessary and are all alike but abstractions from the several forms of atomic interaction.

Many upholders of vitalism surrender at this point. They think it sufficient to point out that the elements, as capable of only physical and chemical manifestation, are inadequate to vital manifestation, and that hence we must posit a new endowment to account for the new manifestation. This is true enough, and follows as a matter of definition; but as long as the new endowment is posited in the physical elements, and not in some separate agent, we still hold the mechanical theory. Physics and chemistry do not explain even magnetism; but we never dream that magnetism is something independent of the elements; we regard it simply as a manifestation of the nature of the elements under peculiar circumstances. No one denies vitality as a mode of agency; the dispute is over vitality as an agent. All the other *-ities* are forms of agency, and the mechanical theorist holds that vitality is no more. The agents are the physical elements in every case.

The mechanical theory is clear at least in its meaning, if not in its possibility. The thought is formally complete. It speaks of activities, forces, and endowments, and names their subjects. But in order to make this view sufficient, we have to add some rather peculiar assumptions. If organisms were all of a kind, or had anything like a common form, it would be comparatively easy to accept the belief that the physical elements which compose a germ, together with those in contact with it, are the only agents concerned. But the forms and qualities of organisms are of the most diverse kinds, while the component elements are all of a kind. Hence it seems as if the elements, because able to enter into any organic form, were indifferent to all organic forms. If there were only one form, we might speak of a "subtle tendency" in the elements to that form, or of an

"affinity" or "inherent aptitude" for it. But when they assume all organic forms, we must either make them as indifferent to those forms as the bricks which are built into a variety of structures are to the plan of those structures, or we must endow them with a great variety of "subtle tendencies" and "inherent aptitudes." In the former case, the variety and constancy of form seems to be a matter of chance or accident; for the matter contains no principle of organic form. Yet the second case reduces to the first, for these tendencies are mutually exclusive in realization, and the elements have in themselves no ground for realizing one set of tendencies rather than another. The coexistence of the tendencies does not explain the selection. Hence, in each case, we have to fall back on the arbitrary constants which enter into the equation. As the laws of motion are consistent with all motions, so the elements in general are adapted to all forms. The ground of direction, then, is to be sought in the conditions under which they work. Under given conditions, they can build only a given organism. But these conditions, again, must lie very deep. If they were merely general conditions, germs might be interchanged; whereas, two seeds grow side by side, and each to its typical form. The germ itself contains implicitly all the differences which become explicit in the organism. But these differences are so many and great that no one would pretend to represent them by difference of spatial collocation of the elements which compose the germ. Such collocation would explain nothing, unless it were attended with peculiar forces.

Here we may fall back on the conception of subtle tendencies which are, in some way, located in the germ. This notion has been formulated in the doctrine of "physiological units," each of which has the power of reproducing the organism under appropriate conditions. But, unfortunately,

even this notion is not as clear as could be wished. It attributes the tendencies to the germ, and forgets that, by hypothesis, the germ is a compound of elements. The tendency, therefore, no matter how "subtle," belongs to the elements which compose the germ. And, without doubt, this tendency is very subtle, for it is really an implicit expression of the plan of the organism. It implies, then, that, under certain conditions, the elements act with constant reference to the plan of an organism; and under certain other conditions, precisely similar elements act with reference to the plan of some other organism. If we should see a pile of bricks moving so as to build a given house, we should probably conclude that some invisible builder was present; but, if we declined this view, the very least we could say would be, that the plan of the house is implicit in the bricks, and that their activities are all put forth with reference to this plan. If we should refuse this admission, then the house-building would be purely a chance-product —a coincidence of moving bricks. But if, in addition to building a single kind of house, we should see them assuming all possible architectural forms, we should be forced either to appeal to chance or to admit that the bricks contain in themselves the plans of all possible combinations. But reason can allow no appeals to chance, and hence we conclude that, to make the elements adequate to the explanation of organisms, we must assume that the plans of all organisms are implicitly given in the nature of the elements, and so given that, when they begin building upon a certain plan, they forsake all others, and cleave to it alone. The action is still mechanical, but, in this action, the mystic nature of the elements unfolds itself, so that organisms result.

This gives us some idea of the complexity of the problem, and of the confusion in popular thought respecting it. This

complexity has been hidden by the simplicity of the terms, and the elements have seemed adequate because of the tacit assumption that there is nothing else in space, and because of some vague and mistaken notions about continuity. These subtle tendencies defy all representation, and even all conception. Their mechanical possibility cannot be construed. They are really nothing but a specification of the abstract notion of ground, without inquiring whether the demand for a ground can be satisfied in this form; and they are attributed to the atoms as a matter of course, because of the implicit assumption that there is nothing else concerned.

But vitalism is equally unclear. In the first place, many of its upholders neglect to say whether vitality is a quality in the elements which conditions their agency, or whether it is a separate agent. Many of the arguments for vitality go no further than the maintenance of the former position, and thus fail to escape the mechanical theory. But suppose we say that life is a true agent which is separate from the physical elements, and which builds them into form. Life would thus appear as the builder of organisms, and matter would appear as simple material.

This view doubtless derives a great part of its clearness and sufficiency from the analogy of man's constructive activities. In itself it is unclear without some further determinations. Is this agent one or many? Is it the same life which works in all organisms, plants and animals alike, or is there a separate vital agent in each one? In the former case, how does this agent distinguish between the plans of the different organisms which it is constructing and maintaining all around the globe at the same time? The readiest answer would be that it is intelligent; but this would go a long way towards confounding it with God. If we decline this view, and say that the agent works differently in dif-

ferent conditions, it is still necessary that it shall be affected in some way by the conditions in order to respond with the appropriate activity. That is, we must bring it into a system of fixed interaction with the elements; and when this is thought out into its implications we are not much advanced beyond the mechanical view.

If, however, we prefer to view the vital agent as many, and posit a separate subject in each organism, we have the same difficulties and some additional ones. The vital agent must interact with the physical elements; and in this interaction the laws of matter would be as prominent as the laws of life. The only advantage this conception would have over the material view would be in planting the "subtle tendencies" in a single definite agent, and in finding the chief formative conditions in the nature of that agent. This would remove the necessity of departing so widely from the common view of matter as we otherwise must; since we could then allow, what all knowledge seems to indicate, that matter in itself is indifferent to organic forms, and assumes them only as it comes into interaction with some agent which contains the ground of form within itself. Life does not start up everywhere, but only in connection with things already living.

But this view contains some special difficulties. The reality is no longer singular and universal life, but discrete individual lives; and these lives must have some source. Have they always existed; are they separately created; do they abide after the organism perishes? These questions crowd upon us. The law of continuity is in active protest. The problem is insoluble as long as we remain on the plane of the finite.

Thus both the mechanical and the vitalistic view of life are seen to be exceedingly obscure when only the problem of organization is under discussion. The matter becomes

still worse when we inquire concerning the subject of the thought and sensibility which seem to be manifested in connection with the organism. Unless appearances are unusually deceiving, there is an inner life of feeling of some sort in connection with all the higher animal forms. Neither theory provides for this. If the body be simply a function of the physical elements, it is sensitive and truly living only in appearance. The difference between it and any complex inorganic mass is phenomenal only, not essential. The atom of hydrogen, or oxygen, or carbon, that may be coursing in a man's blood is no more alive than similar atoms blazing in the sun or locked in the coal-mine. Of course the organism has many qualities which other combinations have not; but, in fact, since matter and motion are all that is concerned in the organism, there is nothing but matter and motion in it. But feeling is something totally unlike motion; and no analysis of motion will reveal feeling as one of its constituents. There is no way of passing from one to the other. The organism, then, is only a highly complex group of physical elements without any proper life or feeling.

The deduction of life from the non-living has led to many agonistic efforts and some notable contributions to the dictionary. A much admired popular formula defines life as an adjustment or correspondence of inner relations to outer relations; and we seem to be getting a deep draught of wisdom undefiled, until we bethink ourselves to inquire what "inner" means; and then it turns out that inner means nothing to the purpose, unless it is referred to the activity of some vital agent. Those things are inner to the body which are vitally connected with the organic processes; and those are outer which are not thus connected, even though comprised within the spatial limits of the body. But when it comes to the deduction of life the mechanical

theorists always delude themselves with words. They point out that in chemistry we pass from the atom to the molecule, and from the simple molecule to the complex molecule, and from the complex molecule to the organic molecule, and from the simple organic molecule to complex organic molecules, and from these again to groups of the same. But these already exhibit signs of life and organization. After a little skirmishing with the formidable terms of organic chemistry, reproduction and heredity are quietly brought in, and the evolution of life from the inorganic is complete.

A word will suffice to show the verbal character of this process. If we begin with matter and motion, we must end with it also; and whatever cannot be construed in terms of moving matter must be rejected as illusory. There is no difficulty in passing from the atom to the molecule, or in passing from simple molecules to complex molecules and groups of molecules; but there the advance ceases. All that remains is to increase the complexity of the molecules and the molecular groups; for this is the only direction which the redistribution of matter can take. When, then, the theorist next presents us with the organic molecule, we are a little puzzled to know what he means by the new adjective. It may mean simply a molecule which is commonly found only in connection with organisms; but in that case it is nothing to the purpose. But if it mean something more than complex, we need to have the distinction between an organic molecule and a complex molecule more clearly stated. It may be said that an organic molecule is essentially only a highly complex molecule, but it manifests different phenomena. We reply that we are after the essential and not the phenomenal. There is no dispute as to the phenomena of organisms, but as to their essential nature. And if their phenomena are all explained by the interaction

of the elements, then organisms are essentially atomic complexes and nothing more.

The truth is this deduction is purely verbal and has a strong smack of question-begging about it. If we should speak only of complex molecules we should clearly see the impossibility of advancing beyond them. Such groups would appear as products of physical and chemical attractions and repulsions, and even the most determined evolutionist would hardly venture to speak of them as alive or as subject to experience and heredity. But if, instead of calling these groups complex molecules and groups of molecules, which by the theory is all they can be, we call them organic, then by the sheer force of the terms we shall find it easy to pass on to speak of organization and heredity; and the way will be open before us. We can then appeal to life and biological laws without any reference whatever to the possibility of interpreting them in terms of matter and motion. But if thought be clear, this procedure must be seen as delusive. There is nothing in the most complex organism but complex molecules; and the only difference between the elements as thus grouped and as otherwise grouped is purely phenomenal. A living thing is essentially an inorganic complex which seems to be alive. In itself one thing is as dead or as living as another. The distinction is only in appearance, and even this appearance is impossible as long as there is no mind to which it appears. A mind which could grasp things as they are would see in an organism only a complex system of moving atoms. Along with this admission goes the absurdity of the notion of heredity. The laws of the elements are hardly to be viewed as acquired or inherited; and since these laws determine all compounds, the organism also must be fixed. Life, then, is phenomenal; and an animal is but an automaton which only seems to think and feel.

We get no relief from this conclusion, if we endow the atoms with the most mystic qualities, or even allow them to be alive. These mystic properties remain subjective to each atom, and manifest themselves externally only in changes of place and condition. The inner life, therefore, would not appear as any factor of observation, but would only be one of the inner forces which condition redistribution. Such a view might help in explaining organization, but not in accounting for the life of the organism. For on this view the organism still remains an aggregate without any subjective unity, or subjectivity of any sort. Hence, the feeling and thought which the animal seems to manifest are again phenomenal. A mimicry of thought and feeling is possible in an aggregate or automaton; but their reality is possible only to some unitary subject which thinks and feels. To say that the organism thinks and feels is thoughtless; for the organism is just such a reality as the public in social science. When we speak of the public thought and feeling, we know very well that only individual persons think and feel. The public, as such, neither thinks nor feels, but only the persons who compose it. We must, then, reduce the animals to automata which mimic thought and feeling, or we must allow a real substantive subject of their mental life.

We are no better off with the view which regards God as the builder of the organism. For still the organism appears either as a pure phenomenon, or as a complex of discrete activities, and as such it is without any mental subject. Hence, any thought and feeling which the animal may seem to show are illusory, and do not indicate any true thought or feeling which the animal has. The view which regards life as a kind of universal agent, manifesting itself in different forms, is subject to the same difficulties. It provides no subject for the individual life and feeling of the individual animal.

Thus it appears that the most important question concerning life is not that of organization, but that of the subject of the thought and feeling which animals manifest. Where it is merely a question of organization, as in the vegetable world, there are several possible views, each of which would be adequate; but when mental manifestations appear, as in all the higher orders of animals, then we must make a choice. Either we must view these manifestations as purely illusory, and make the animals senseless automata which only mimic thought and feeling, or we must declare that with each new animal a new factor is introduced into the system as the thinking and feeling subject of the animal's experience. Thus the problem of life comes back again to the problem of the soul.

This long excursus was undertaken for the sake of showing how confused and uncertain popular thought is on this subject. On the basis of the popular metaphysics there is no way out of the confusion. We now return to our own conception of the interaction of soul and body.

In this view the soul is posited by the infinite, and the body is simply an order or system of phenomena connected with the soul which reproduces to some extent features of the general phenomenal order, and which also expresses an order of concomitance with the mental life. Thus it becomes a visible expression of the personality, a means of personal communion, and also a means for controlling to some extent the inner life. The concomitance is the only interaction there is; and its determining ground must be sought in the plan and agency of the infinite. Only in this sense of a physical concomitance is it permissible to speak of a physical basis of thought, or of a physical foundation of mental activity. And only in the same sense of concomitance is it allowed to speak of the soul as building and

maintaining the organism. Each is adjusted to the other in accordance with the plan of the whole; but so far as the two factors are concerned, the connection is logical, not dynamic; and any dynamic relation which we may affirm must be seen to be only a form of speech. We may use such language for convenience of expression, as when we apply causal terms to phenomenal relations, but we must not forget its metaphorical character.

In estimating, and adjusting ourselves to, this general result we need to recall the distinction between the inductive and the metaphysical stand-point. In studying either life or mind the inductive scientist is in his full right when he looks for the phenomenal or experienced laws and conditions, and traces them as far as he can. At the same time he must be reminded that these laws remain on the surface and contain no causal efficiency. If he could trace the phenomenal order into minute details the nature of the causality would remain unrevealed. And, on the other hand, the metaphysician who is persuaded that the infinite is the ever-present source of all things must not overlook the fact that the cosmic causality proceeds in certain ways, and that a knowledge of those ways is of great practical importance. With this understanding we may carry on the study of the physical basis of life and mind without the least fear of seeing them vanish into mechanical by-products. And seeing that the soul is that with reference to which the organism has its existence, we may also speak of the soul as the builder and maintainer of the organism. There is no reason to think there would be any organism if there were no inner life.

This general view, however, according to which the infinite is a silent factor in all finite ongoing will tend to restrict our theorizing when it far transcends experience and practical interests. Our knowledge even of phenomena is

very superficial, while of the underlying plan which conditions the form and movement of the whole we have the scantiest knowledge. As this is more and more seen to be the case, abstract and theoretical deductions will gradually be restricted to a reasonable degree of extension to adjacent cases; and whatever lies beyond these will be handed over to magazine science.

The physical and mental series are separate and incommensurable; it is conceivable, however, that there should be a correspondence between them, such that a given state of the one should always attend a given state of the other. Without some order of this kind, the mental life would be lost in hopeless confusion. This would be the case if the same sense stimulus might result in the perception of different objects, or if the same volition should lead to different deeds. Both knowledge and action would become chaotic. The need is clear, however, only for those mental states which result in objective knowledge, or which produce objective effects. The matter is much more uncertain when mental states are concerned which arise within thought itself and without any assignable physical stimulus. The matter is further complicated by the modifying influence of attention or mental distraction, because of which the physical state often fails to be attended by its appropriate mental state.

When we pass beyond the experienced concomitance and affirm an absolute order, the result is unedifying. Such a view can never be submitted to a practical test, and can only be a matter of speculative fancy. Whoever will reflect on the enormous complexity of thought and feeling and their multitudinous shades, together with the still greater complexity of contexts in which they are perpetually occurring, will see that to find an exact physical representative for each

state of thought and feeling, we must run into the molecular realm forthwith. Whoever further reflects on the complete ignorance on our part of what it is in the brain molecules or phenomena which fits them to attend any thought at all, or one thought rather than another, will see that this field can only be the subject of lawless imagination. Any one with a sense of logical responsibility will content himself with tracing as far as may be the concomitance in experience without affirming any absolute laws whatever.

The wisdom of this last position is seen on contemplating the unwisdom of those who have sought to find a physical correspondence for every mental fact. The imagination has run riot in mythological molecular constructions. "Neurotic diagrams," "apperception and ideational centres" have been invented. Cells, vibrations, and nascent motor excitations in rich variety have been feigned; and these are supposed in some unexplained way to stand for mental facts, and in imaginary fluctuations and permutations to express the laws and relations of the facts. The mental facts, as qualitative data of consciousness and in their ideal logical relations, are too refined for our understanding. Hence we first interpret them into a series of physical fictions, which soon pass for the facts themselves, and then we victoriously deduce the mental life by an exegesis of our metaphors.

It would be impossible adequately to express the illogical and fictitious character of most of this work. The speculator is unable to grasp the mental facts in their unpicturable nature, and substitutes for them some physical image. The only demand he makes upon this image is that it shall be easily pictured. Then come fictitious and improvised anatomy and a great cloud of whimsies about cells and fibres and nascent motor excitations and inter-cellular activities. But whoever affirms such things is bound in logic

either to show by analysis of the mental life that we must affirm the facts in question, or else by observation and experiment to prove that these facts exist, and especially that they exist in the alleged correlation with the mental facts. That brain-cells and fibres exist is far enough from proving that they have any such functions and relations as our pictorial psychology ascribes to them. The strict application of this rule would probably make a solitude and a grateful silence in this region, and would result in a somewhat agnostic attitude towards all speculation on this subject which goes beyond some general principles which may be verified in experience. Such are the general laws of concomitant development, laws of habit, laws of health, laws of rest and repair, general laws of the influence of body on mind and of mind on body. We know that the physical echoes the mental and that the mental varies with the physical. Laws of this kind lie open to investigation; but whatever lies beyond them in the way of abstract speculation is to be received with the utmost caution. Most of what has been done in this field is a sad reflection on human intelligence.

Origin of Souls

On this subject only two views are self-consistent, the creation of souls, or the reduction of mental phenomena to functions of organization. The second view is materialism, and has been finally condemned.

The first view may be held in a double form. We may suppose that souls were all produced by some original creative act, or that they are individually produced in connection with the individual organism. The former conception would give, so far as this life is concerned, the doctrine of the pre-existence of souls and possibly some form of transmigration, or metempsychosis.

This doctrine of pre-existence has found favor with some speculative and religious dreamers, but it is so utterly without any positive foundation or speculative advantage, and involves us in so many gratuitous difficulties, that it is likely to be confined to the dreamers. An existence in which the solution of personality is so complete as this view would demand would be only verbally the same. Practically, then, we are shut up to affirm the individual creation of souls in connection with individual earthly existence.

This view, however, has not always found favor. Theologians especially have found it a stumbling-block, and have sought a more excellent way. The soul of the child is said to be in some way derived from the parents, the doctrine of traducianism. It is held that there is a law, or a world-order, according to which souls are produced, yet without being created outright. This is vague. A law, or world-order, is only a conception and always needs some agent or agents for its realization. Hence, to make this theory intelligible, we must know what the agents are which produce the effect. If it be said that God has made the elements such that when combined in certain ways mental phenomena result, this is simple materialism. If it be said that when the elements are combined in certain ways a substantial soul results, this is to allow creation; but it does not tell us what creates. But the fancy that the elements, or the souls of the parents, have power to create a being beyond themselves, or that they give off something out of which new souls can be made, is utterly untenable. Emanation, budding, fission, division, and composition of any kind are forbidden by the necessary unity of the soul. There is nothing to do but to fall back on the world-ground, or God, and say that where and when the divine plan, which is the law of cosmic activity, calls for it, there and then a soul begins its existence and development. It is not the out-

come of its finite antecedents, but is a new beginning in the system and is immediately posited by the infinite.

There are two classes of difficulties that meet us here. The first class springs from the imagination. We try to picture the operation in terms of space. We tend to conceive the soul as a thing to be brought from somewhere, probably from some extra-siderial region, and we are puzzled concerning the bringer and his space relations. In addition, there is a fancy that the divine agent must appear among the phenomenal antecedents, a conception which both science and religion would perhorresce. The matter admits of being treated in a very pleasant and lively fashion; and when the various fancies are traced in detail the conception seems to perish of its own irreverent absurdity. But all of these whimsies disappear when we see that all finite reality has its spaceless roots in the omnipresent divine, and that all things stand or move or come to pass because of the immanent God. The divine immanence and the non-spatiality of the real, in distinction from the apparent, remove the difficulties arising from the imagination and the deistic type of philosophy with its absentee God.

If then we ask how souls originate, the answer will fall out differently according to our stand-point. If we occupy the phenomenal or inductive stand-point the answer will recite the various phenomenal conditions revealed in experience. If we are seeking for the essential causality no answer can be complete which omits God.

The second class of difficulties referred to arises from several sources, theological and moral exigencies and the facts of heredity. All of these taken together are supposed to disprove the direct creation of souls.

The strictly theological exigencies are mainly connected with the doctrine of original sin and its transmitted guilt. Some have thought that a doctrine of creation would cut

off the entail or the corruption of blood. This difficulty is fast becoming obsolete.

The moral exigencies arise from the supposed difficulty in assuming that God should make morally imperfect souls. And human beings, by the time they exhibit any moral traits, often show such earthiness that we hardly like to think of them as fresh from the hand of God.

This difficulty impresses the imagination and a certain demure type of piety, but traducianism offers no way out. Its metaphysical untenability has already appeared. Parents are not creators. They and their deeds are only the occasions on which the world-ground produces effects and introduces new factors into the system. Neither can the unæsthetic and unseemly features of the case be removed by introducing any sort of mechanism between the creator and the final product. Responsibility cannot be diminished by employing machinery to do our work.

The argument from heredity mostly mistakes a theory of the fact for the fact itself. The fact is simply a certain similarity between parents and children. There is likewise often a certain dissimilarity. The likeness which the general type demands is supposed to be a matter of course. The likeness which relates to specific peculiarities is referred to heredity. If it refers to remote ancestors it is atavism, or a case of reversion, etc. The unlikeness is referred to variation, or possibly the instability of the homogeneous, or some other formidable phrase.

The likenesses and unlikenesses among genealogically connected individuals are the fact; all else is theory. The likenesses are explained by heredity. But heredity is a metaphor. In a literal sense one individual can inherit nothing from another. Soul substance admits of no division. Qualities can neither propagate themselves nor be passed along. We are led by experience to expect certain similar-

ities between the generations, though in most cases we have to wait for the facts to declare themselves. But the ultimate ground of the relation, whether of likeness or unlikeness, must be sought not in the finite series itself, but in the plan of the infinite power which produces individuals and determines their nature. Of course this conclusion does not forbid our availing ourselves of all the knowledge which experience may furnish in this field, neither does it deny that this knowledge often has great practical value; it only warns against the fancy that the facts explain themselves, or that they can be explained by figures of speech. The wild work of popular writers on this subject and of students of genealogies, particularly of their own family, is distressingly familiar. The theme readily lends itself to fine writing, and has been prolific of not a little rhetoric.

What we have said thus far applies to heredity in the mental field. As a theory in speculative biology, the doctrine of heredity generally contradicts itself. In a scheme which builds on fixed physical elements with fixed forces and laws, there is no place for heredity of any kind, except as a description of the successive phases of a phenomenal order. It would be such heredity as might exist among the successive combinations in a kaleidoscope. And if we begin without such forces and laws we lose ourselves in a primal indefiniteness which would found nothing and be nothing; and out of this we could never emerge except by verbal incantations about differentiation and integration. It would be an interesting task to determine the meaning of heredity, habit, and such terms in a purely physical system; and it might not be easy to do much in biological speculation with the resultant conceptions. Out of some vague sense of this implicit contradiction has arisen in unclear minds a tendency to confound both realms—to vitalize matter and devitalize life. Physical laws are spoken of as

"only the fixed habits of the elements," and habits in living things are simply the greater facility due to the removal of mechanical obstruction. Thus the two realms are happily approximated in word, which is the main thing; and the work is completed by a discussion of the "psychology of the cell" and the "psychology of the micro-organisms." Both physical and mental science cannot fail to be greatly advanced by these violent plunges into the depths of antithetical absurdities.

The ontological individuality and separateness of souls vacate all such questions as whether the human mind develops from the brute mind; whether they differ in kind or only in degree. There is no human mind and no brute mind, but minds, no one of which develops from any other, or inherits anything from any other. The possibility of arranging these in ascending linear order is only a logical one, and it in no way does away with the metaphysical separateness and incommunicability of each individual. The fact that they appear in connection with a series of organisms genealogically related decides nothing as to what the individual is when he comes, or what the essential power is which produces individuals. Popular thought finds the causality in the phenomenal antecedents, where it never can be. For the rest, the traditional debate does not touch reality at all, but only the contents of a pair of logical abstractions, the human mind and the brute mind. If the two abstractions were found to be identical, the concrete problem would be as hard as ever; for this consists not in a verbal shuffling of logical symbols, but in the production of a series of concrete minds, each of which is a distinct individual and, except in a figurative sense, inherits nothing from any other. It has been mistakenly supposed that the origin of species is the great problem, whereas the important question concerns the origin and nature of individuals. All else is logical manipulation.

The Future of Souls

On this point speculation cannot say much that is positive. The fact of experience is, first, that in our present existence the mental life has intimate and complex concomitance with the physical, and, secondly, that with the removal of the body the phenomenal manifestation of the soul life ceases. We know death only from the outside; what it is from the inside is beyond us.

The fact that consciousness varies with physical conditions is often used to prove that apart from the body the mental life would be impossible, and hence that for the conscious life, at least, death ends all. If, then, we admit a soul in connection with the body, we must look upon its conscious life as bound up with the existence of the body.

But the matter is not quite so simple. We do not see that the body is necessary to consciousness, but that abnormal physical conditions may derange or hinder the development of consciousness. On the most realistic view of the body, it might conceivably be altogether other than it is, and the mental life might go on just the same. We see what we view as mental life in connection with the most diverse organisms. There is, therefore, no *apriori* connection between the mental life and any particular type of organism; and, indeed, we are quite unable to tell in any case what the present or any other organism could do as a ground of mentality. The relation, whatever it is, can only be viewed as factual and contingent. The actual body, then, is no analytically necessary factor of our inner life. We may suppose the necessary stimulus thereto given directly by the infinite, or we may suppose a succession of organisms to provide the conditions of higher and higher mental life.

As to the fact of future existence pure speculation cannot decide. It destroys knowledge, but it makes room for belief. Criticism makes short work of the pretended disproofs of immortality, by showing that they are only weaknesses of the dogmatic imagination. It equally overturns the sense dogmatism which finds in the spatial and physical the supreme, if not the only, type of the real. It shows that the physical, even if temporally first in the finite order, can lay no claim to be the truly real of which all later factors must be viewed as only products. The reality of the finite would not be the physical alone, nor the mental alone; but both alike must be viewed as phases and implications of the thought and plan of the infinite. By showing the phenomenality of all spatial existence and of space itself, criticism further removes the difficulties which arise from the attempt to construe the soul and the immortal life spatially. The decay and failure of the body do not analytically imply the destruction of the soul, as would be the case if the body were its causal ground. The soul, when the body fails, has not to go wandering through space to find another home; it is continuously comprised in the thought and activity of the infinite. God gave it life, and if he wills he will maintain it. This actual existence of all things in God, while it does not remove the mystery of our being, does diminish the sense of grotesque forlornness which the conception of our disembodied existence is pretty sure to awaken when we conceive it in spatial forms.

Speculation makes room for belief, but for positive faith we must fall back on the demands of our moral and religious nature, or on some word of revelation, or on both together. Our metaphysical reasonings on the nature of substance do not help us here. Speculatively we can only lay down a formal principle without being able to draw any concrete inferences from it. As all finite things have the

ground of their existence in the divine plan, we must say that they will continue or pass away as their significance for that plan demands. Of course we are ready to say that only moral values are eternally significant, but it is well not to be too sure of our deductions in the concrete. If so many seemingly absurd things can exist, there is no telling how long they may continue; and, on the other hand, there are few things of such supreme value as to make their vanishing a self-evident absurdity.

CHAPTER III

OF MENTAL MECHANISM

In a previous chapter we have treated of mechanism and mechanical explanation. We seek to break up the complex into the simple and combine it again from its elements. We look for the elementary laws of procedure and then seek to understand the fact as a result of those laws. In the mechanical and inorganic world this largely takes the form of analysis and synthesis according to rule, or of decomposition and recomposition. We break up the body into elements and regard it as resulting from their union, etc.

As the inorganic sciences first attained to any settled and successful method of procedure, they very naturally tended to give law to the studies in higher realms. Accordingly, the attempt has very generally been made to carry this mechanical method into the organic and mental field, but only with imperfect success. Explanation by composition is possible only when dealing with numerical and inorganic wholes, the parts of which may exist independently. But the living body is not the sum of its parts, but the parts are functions of the body. The organic law of the whole precedes and determines the parts; and the parts are not parts existing by themselves, but only in connection with the whole. Neither are the parts mechanically united by mere juxtaposition; they unfold organically through the life within.

No mechanical or spatial representation of organic activ-

ities is possible. And the mechanical study of life must be confined to a study of the observable phenomenal laws revealed in organic processes. This study is of the greatest practical value, but it remains on the surface. When it claims to reveal life itself it loses itself among showy verbal generalizations which at bottom mean nothing or are mere assurances of dogmatic theory.

The same is true of the mind in an even more marked degree. If organic activities cannot be conceived in spatial form, they at least produce spatial forms. They are, then, allied to space in a way which removes any manifest absurdity in speaking of them in space metaphors. But when we come to the facts of psychology, neither the mental subject nor the mental states have any spatial properties, and these properties cannot be ascribed to them without absurdity. Yet because we approach the mental life from the physical side, and all our language concerning it is cast in the moulds of matter, there is an almost universal effort to express the life in spatial and mechanical terms; and, in analogy with the inorganic sciences, composition is put forward as the great type of explanation. As masses are compounded of molecules, and molecules of atoms, so all complex mental states are compounded of simpler ones, and are to be understood through them. This is the conception which underlies the "synthetic psychology."

This view is perfectly natural and perfectly clear to one who approaches the mental life from the physical side, and without the critical training which enables him to see the mental facts in their unique and incommensurable character. The result is that a fearfully large part of psychological literature is a mirage of words and physical images, which either conceal the facts entirely or distort them out of all likeness to themselves. Nowhere has the fallacy of language wrought greater havoc and ravage than in this field;

and psychology has no more pressing duty than to throw off its age-long bondage to figures of speech. Of course in studying the mental life, we must look for the fundamental psychological laws, and must seek to exhibit particular facts in their relations to these laws; and if we choose to call this procedure the mechanical method or the scientific method, there is no objection. But we must never forget that the supreme thing is to know the facts themselves, whether we can make anything out of them or not. Explanation is desirable when we can get it; but explanation by distortion is unprofitable business.

Composition, we said, is the great type of explanation in the inorganic field. We have the atoms, and by variously compounding them we explain molecules and masses. The associational psychology is the analogue of this in the field of mind. Elementary mental states, as sensations, are assumed to be the only original raw material of consciousness, and out of them by composition the higher forms of mentality are built up. This view is constructed entirely on the model of physical mechanics, and more especially on the model of molecular mechanics. The sensations and their traces in memory are the units of the mental life, and by their combination they are supposed to explain all the higher forms. This view finds its most elaborate exposition in the Herbartian psychology; and in all its forms composition is the type of explanation relied on. Compound sensations, groups of sensations, conception masses, are phrases of constant recurrence.

All this is illusion. It arises from hiding the facts behind physical and spatial metaphors, and then mistaking the metaphors for the facts. Hence the need of rigorously inspecting our terms in order to detect any parallax with the facts. All spatial terms as applied to mind and consciousness must be seen in their figurative character. Things

or events are not in the mind or in consciousness in any spatial form or relation. They are neither before nor behind, neither to the right nor to the left of one another. To be sure we use spatial terms, but to fix the meaning, we have to pass behind the terms to the experience.

If then we ask what being in consciousness means, the dictionary, and etymology, and the imagination will not help us. We must return to the experience, and then it turns out that being in consciousness means what we experience when we are conscious of something. Objects are separated and united, not spatially, but consciously and logically. They are comprehended in the spaceless, partitionless, unpicturable apprehension of the conscious mind; but, as mental events or forms of mental activity, they have no spatial properties or relations of any kind. Except in a figurative sense, then, nothing is *in* consciousness. The exact fact is that we are conscious of certain things; and this consciousness admits of no representation in space images. It is absolutely unique and can only be experienced.

With the vanishing of space forms and relations from the mental states, the notion of a mental mechanism begins to grow obscure. When we have distinct things in space we can easily picture various combinations; but when the spatial relation is denied we begin to grope as to the meaning of mechanism. The matter is still worse when doubt is cast on the substantiality of the component factors and on their dynamic relations; and this doubt emerges as soon as we consider the alleged elementary elements of the mental mechanism.

What are sensations? Because of the implicit working of the category of substance, they tend to take on a substantive and even a substantial form. They float vaguely in unclear thought as a kind of something, mindstuff, units of consciousness, or some such thing; and the analogy of molec-

ular mechanics comes to our aid, and the mental mechanism forthwith becomes a solid reality.

We see how the notion arises, but before we accept it we must examine it more closely. Are, then, sensations things, fragments of mindstuff, or elementary substantial units of mentality? Probably no one would answer in the affirmative when the question is thus barely put. An indefinite amount of psychological language and theory implies their thinghood, but a little reflection dispels the illusion. Well, then, once more, what are sensations?

Suppose we call them mental states, or affections or modifications of the sensibility. They certainly are such; but what can we make of such sensations in constructing a mental mechanism? To begin with, the states as occurring, or as mental events, vanish with their date. They are perishing phantasmagoria without anything abiding in them or after them. With such data we can construct nothing. But possibly it is their "traces," subconscious or nervous, which abide. This notion of "traces" can be easily pictured, and is very popular. But the traces are in the same dilemma. The traces have no identity or constancy in themselves. They are mainly mythological constructions, but in any case they abide only as Niagara abides. In fact, as our studies in epistemology have taught us, in the temporal world of psychology nothing abides. It is only in the ideal world of logic that anything abiding can be found. It is not the sensations, then, as mental events which abide, but rather and only the constant meaning which they express, or of which they are the bearers. This meaning, however, is a purely logical and ideal function, and instead of constructing thought it is its product.

And this leaves us more in the dark than ever as to the possibility and even as to the meaning of our mental mechanism. Both the spatiality and the substantiality of the

factors have disappeared; and the real working factors turn out to exist only in and through thought itself. Without the universals of thought, the doctrine vanishes into a phantasmagoric flux; and with them it begins with the very universals it claims to generate.

But the deepest depth is not sounded until we inquire concerning the dynamic relations of the sensations. If we conceive the sensations, either as floating free or as affections of a mental subject, there is no answer to this question which does not either commit us to nonsense, or else subordinate the mechanism to a higher principle. The nonsense results when the sensations are conceived as particular and separate existences, endowed with special forces and united thereby into mental groups. We see this as soon as we remember the adjectival nature of sensation, its phantasmagoric and vanishing character as mental event, and the impossibility of forming any conception of inherent forces in such a case.

In the other case, where the sensations are regarded as affections of a mental subject, we cannot work the doctrine without appealing to some higher principle. At first it might seem that as affections of a unitary subject they would necessarily be brought into interaction, and then it would be natural to consider them as endowed with inherent forces, whereby they modify or combine with one another. Herbart's theory is the most distinguished effort to establish this view.

This doctrine seems simple and clear until we try to understand it, and then it is seen to be ambiguous and uncertain. By sensation we may mean the logical contents, and we may mean the psychological activity involved. Sensations in the former sense have only logical existence, and hence have only logical relations. Dynamism is absurd when applied to logic. An inference is not a dynamic re-

sultant, but a logical consequence. The mechanism, then, if there be one, must refer to the psychological activities.

But to endow these activities with forces of mutual attraction and repulsion is unintelligible. Being themselves but flowing forms of action, they cannot be made agents. If we decide that they are at least separate states of the subject, and thus must influence one another, and hence must be endowed with forces, we are no further on. We are still in the midst of ambiguity. We oscillate between the substantial and the adjectival conception, and between the psychologic flow and the logical fixity. In any case there is no way of dynamically representing the relations of the mental states. When several impulses, x, y, z, are communicated to the same body M, they unite in a common resultant R, in which x, y, and z no longer exist. If we should suppose them to persist as separate impulses, and should next endow them with attractions and repulsions for one another, we should have precisely the problem in hand. The forces are unintelligible and the unity of the subject disappears.

The problem is insoluble from the side of the mental states. Any relation which they may have must be through the unity of the mental subject; and what they are, or what their mutual relations may be, depends not on themselves, or on any assumed interaction among them, but rather and solely on the unitary mental nature which at once determines their existence, and prescribes their reciprocal relations. This is the higher principle to which the view must finally appeal; and of this principle no spatial or mechanical representation is possible.

This result contains the answer to another scruple which may arise. At all events, we might say, the mental present is the outcome of the mental past; and what is this but to say that it is the resultant of the past? If then we could

have exhaustively grasped the past, we should have seen the present necessarily resulting.

This is a specimen of the vague and hasty generalizations into which the uncritical mind, full of notions about continuity and law and totality, is sure to fall. But not to mention the uncertainties involved in the assumed reality of time, the suggestion becomes relevant only through the further assumption that all that need be taken account of is the particular mental states, or that the mental nature is exhaustively expressed in them. This cannot be allowed; and if there be a mental nature which determines the relations and resultants of the mental states, the claim is unimportant, even if true. It would be like a claim that the development of the organism is intelligible if we consider not only the actual disposition and interaction of the parts, but also the immanent law which determines the direction and type of growth. This would indeed be true, but, as assuming the ground of the progress in the assumed data, it would not be a great contribution to knowledge.

In the Herbartian view the mind is simply the unitary subject which holds the elementary mental states together. All else in consciousness results from their interaction. The mind is the passive stage across which they pass, or on which they unite or divide, mix and mingle. This exactly inverts the true order. The entire movement can be understood only from the side of the unitary nature, and in no way from the side of the particular mental events. The view itself arises from thinking in sense forms and physical metaphors.

Thus the spatiality, the substantiality, and the dynamic quality disappear entirely from the factors of our mechanism. We may still retain something which we call mechanism, but at all events all attempts at constructing the

higher forms of intelligence out of the lower, all explanation by composition, must be abandoned. Sensations are not stuff which can be variously moulded, or substantial units which may be variously grouped. Neither are the higher conceptions compounds which admit of being decomposed into something else. They may emerge only under sense conditions, but they are in no sense made out of them.

The matter may be abstractly put as follows: Suppose that *a*, *b*, *c*, *d* are elementary sensations which are followed by *M*. *M* may coexist with *a*, *b*, *c*, *d*; and then the latter would not be the components of *M*, but its conditions. Or *a*, *b*, *c*, *d* may disappear from consciousness and *M* takes their place. In this case we may say that *a*, *b*, *c*, *d* have fused into *M*; but this would be only a metaphor. Or we may say that *a*, *b*, *c*, *d* are *M*; and this would be false. It only remains that we say that *a*, *b*, *c*, *d* are conditions under which the mind produces *M*. This does not contain *a*, *b*, *c*, *d*, and is not made out of *a*, *b*, *c*, *d*, but arises under the conditions *a*, *b*, *c*, *d*. And in order to do this, there must be a specific mental nature, *N*, which contains the ground of the new reaction *M*; otherwise there is no ground for going beyond the original *a*, *b*, *c*, *d*.

With this result there remains nothing of the mental mechanism beyond the general notion of law; and this must be restricted to phenomenal significance and a reasonable degree of extension to adjacent cases. In other words, we must restrict ourselves to the laws we find, and must hold them for what they are practically worth, without erecting them into an absolute system, dynamic or otherwise. But the mechanism of the constructive and synthetic school, whereby all higher forms are deduced or built up from lower forms must be resigned to the pictorial psychologists and writers of popular pedagogics, who have always found their advantage in it. As the material mechanism

of nature must be restricted to phenomenal significance, and in many cases even to a device of method, so the mental mechanism must be similarly restricted. In neither case are we permitted to think we are dealing with the real factors which produce the phenomena. In the case of the mental mechanism, the alleged factors are absurd when hypostasized as realities and endowed with forces. We have absolutely no categories which will furnish any insight into the causality involved; and we must content ourselves with describing the phenomenal order as it is revealed in experience. All else is rhetoric or fiction.

The English associationalists have never accepted the Herbartian ontology; but they have agreed in viewing the sensations as the raw material of the mental life, and in viewing the higher forms of mentality as resulting from the lower forms under the law of association. They have also been, if possible, even more unclear than Herbart in their conception of their own position. They waver between regarding the association of ideas as an ultimate fact, and viewing the relations of contiguity, similarity, etc., as forces of mental cohesion and movement. How to give such relations dynamic significance is an exceedingly difficult problem, and has commonly been solved by simply using dynamic terms. What it is which is associated has also never been clearly thought out. Is it particular states, or logical universals? It is generally given out that it is the former; but we have seen that the former are nothing whatever for intelligence, until they are elevated to the plane of the universal. Purely particular experiences admit of no association, because they admit of no existence. And when the theory sets out with the universals which it professes to generate, its success ought not to surprise us. But the fundamental conceptions being thus unclear, it is not strange that their application should be full of uncertainty.

In addition to explaining construction, the mechanical process is supposed equally to explain reproduction. Here rhetoric has wrought some of its worst ravages. We first substitute physical images for the facts; then we hypostasize the images and endow them with forces, and finally we regard the images as having veritable identity in time. The result is a grotesque mythology which is solemnly taught and devoutly received as the sincere milk of the psychologic word, but which in fact is the crying scandal of psychological science. This hocus-pocus necessarily results from trying to represent the unpicturable facts of psychology in the picture forms of the spatial imagination. One must read in the synthetic psychology to get an adequate idea of the extent to which these mythological fictions have infested the science.

It is easy to see how the illusion with respect to reproduction arises. We recall the past, we say, and forthwith we judge it must have been somewhere in the mind; how else could it be recalled? We have knowledge of many things of which we are not always conscious; and when this knowledge is not in consciousness, where can it be but below consciousness? And this sub-conscious region is easily figured as the vast halls or dim chambers of memory, where the past is stored, or, more scientifically, as submerged strata in which traces of the ancient life remain, or, both scientifically and philosophically, as filled with latent mental modifications and sub-conscious or sub-liminal mental states, or, as the last word of the objective method, as filled up with nascent-motor excitations with ideal attachments. Or we may endow the ideas with attractive and repulsive forces whereby they repress or re-enforce one another. And if we next endow consciousness with a "threshold," and suppose that when the intensity of an idea is above a certain limit it is in consciousness, and that when it sinks below

that limit it is out of consciousness, we see at once that reproduction is a simple matter; it is simply the reappearance above the threshold of ideas which have been in the mind since the original experience. In all of these cases reproduction consists in bringing back into consciousness matter which exists in some form outside of consciousness. Memory, of course, has no longer any mystery; for we see how the same idea sinks below and rises above the threshold. This sinking and rising are respectively forgetting and remembering; and the identity of the idea throughout the process manifestly secures the validity of recollection.

The critical reader is familiar with the vast amount of this matter in popular psychology. A first criticism must consist in inquiring into the meaning of reproduction itself. What is reproduced, the original fact as mental event, or the logical contents of that fact?

The question answers itself. The original fact as particular mental event vanished with its date, and can be recalled as little as its date can be. The logical contents, on the other hand, have no psychological and temporal existence. They are a product of thought, and exist only in the ideal world of logic. With this insight all that elaborate machinery vanishes as an imaginative fiction.

The reproduction of an idea is a permissible phrase in popular speech, but in reality it would mean the production of another idea, psychologically considered, but with the same logical contents or value. But this sameness, as only a logical identity, exists only for thought and in thought. And it exists for thought, in the case of reproduction, only as the mind relates the ideas to itself and to one another under the form of time, and then assimilates the new idea to the old by identifying the contents common to both. Hence reproduction is impossible as a psychological fact in any case; and it is possible as a logical fact only to a mind

endowed with memory. Reproduction could never be known as such by a mind without an independent power of memory. In such a mind there might be a stream of similar experiences, the similarity remaining unrecognized, but there would be no suspicion of reproduction.

When the speculator assumes that identically the same things recur in reproduction and are known as the same as a matter of course, reproduction seems fully to explain memory. Or when he supposes that similar events occur in experience and that this similarity is recognized as self-evident, once more reproduction seems fully to explain memory. But when it is seen that both sameness and similarity are logical relations; and that they can exist in this connection only for a mind which can give its experience the temporal form, and identify the constant contents in the changing states, then it is plain that we must invert the order and explain reproduction by memory instead of explaining memory by reproduction.

For the uninitiated of course this will be an unintelligible refinement. As experience occurs in time it will necessarily recur in the old temporal form. And when we think of the original experience in its temporal order and relations, it seems about self-evident that there is nothing for it to do but to come back just as it was. And when it comes back the mind will recognize it as a matter of course, for how could it be otherwise? But when we remember that memory, so far as it is in time, is in the present, that past experience is neither in the mind nor out of it in a spatial or representative sense, that ideas have no local tags or temporal signs, and that events can be in time for the mind only as the mind gives them the temporal form and fixes their temporal relations, the matter is no longer so simple.

Memory itself can be explained by nothing but itself. If we should suppose experience registered in the mental

mechanism, or written out in full on the nervous or spiritual substance, or should suppose a mental mechanism continually producing a set of similar ideas, not a step would be taken toward memory. The person who finds in such a fact a full explanation of memory merely mistakes his knowledge of what is to be done for the development of that knowledge within the mental mechanism itself; and that is quite another matter.

In so far as we distinguish in reproduction anything other than memory proper, it must be brought under the general notion of habit. In the mental and organic world facility increases with practice; what has been done can be more easily done; there is a tendency to repeat past forms of activity, or to complete them, if any factor of a past form be given in present experience. Here belong the laws of mental association. But of these laws also no mechanical representation is possible. The facts have no physical analogue; and the application of physical images only misleads by a false appearance of knowledge, while they really prevent us from perceiving the true nature of the facts. The mechanical and dynamic categories are illusory in this field. The facts cannot be pictured, but only experienced. If we would know what they are we must enter into consciousness itself, and note the experience in question. All that is possible, then, is to seek some expression for the facts which shall give them without distortion, and without admixture of misleading theory. We venture the following statements:

1. Thoughts and mental states in general are not things, but mental acts or functions. As such, they exist only in and through the soul's act; and when the act is not performed they exist nowhere, whether in consciousness or out of it.

2. When in a later experience any elements are given

similar to those in an earlier experience, the earlier experience is often reproduced in its significance.

3. Reproduction in no way brings back the old fact as mental event. The mind performs anew the ancient function, thus producing a new experience but with a content similar to the old.

4. The past is not in the mind at all except in a figurative sense. The fact is exhausted in the power to rethink the past and to know it as past. This power of reproduction and recognition admits of no deduction and is a unique fact of the mental world. All attempts to tell how it is possible overlook the essential features of the fact; and the various faculties invented for its explanation are abstractions from the fact itself.

Nobody can remember for another. The notion of an organ or mechanism to remember with is ludicrous. After notebooks, memoranda, brain registers, vibrations, vibratiuncles, and nascent-motor excitations have done their best, there is still no provision for the unique act of memory. The living mind must do this for itself. And the laws of association may not be looked upon as causal or as being anything more than descriptive specifications of a process which admits of no construction. The explanation they give consists in classification and leads to no insight. When a so-called fact of reproduction occurs, we classify it under one or another of the laws of association, but we have no knowledge of the inner nature of the fact. And assuming the law, we commonly have to content ourselves with finding our way from the fact to the law without being able to reverse the process and pass from the law to the fact. What associations a given fact will call up is beyond us. We have to wait and see; and then we may possibly find some law exemplified. Of course we fancy that if we knew all the past history of a mind and its present circumstances as well,

we could foretell the course of association; but this amounts only to saying that there is a sufficient reason in the case. What it is or how to conceive it remains as dark as ever. The attempt to conceive it in mechanical terms and spatial figures leads to absurdity, and beyond these all is mystery.

For form's sake a word may be devoted to the fancy that this mystery of reproduction is greatly cleared up by falling back upon the brain as the seat of the mental mechanism. Only suppose ideas to have physical representatives in the brain and light begins to break in. These representatives abide, and by their dynamic relations determine one another, and thus mediately they determine the ideas. Hence all that takes place in consciousness is but the echo of a series of activities in the brain.

For all who think in pictures this view is a relief. Reproduction as a psychological process is fairly obscure, when the problem is understood; but "this looks better. One sees both where and how." It is in the brain that the work is done; and the nerve cells or nascent-motor excitations are fully equal to the task.

With a few additions this theory would be adequate:

1. There is needed an independent power of memory in the mind itself. Without this there might be in a way a recurrence of experience, but never an experience of recurrence. This apart from the fact that mind is needed to make the mechanism itself possible.

2. There is needed a parallel reproductive activity in the mind itself. However wonderfully the nascent-motor excitations might work, the product would be non-existent for the mind unless it built it up within and for itself.

3. There is need for some exposition of the meaning of the doctrine itself. Of course knowledge is not in the brain, for that is purely a function of consciousness; and the re-

lations which constitute knowledge are not in the brain, for they have only a logical existence and depend entirely on the relating activity of thought itself. And what is true of the original knowing is equally true of the later remembering. It all lies on the mental side, and is pure nonsense when located on the physical side.

4. Hence there is special need for more light on the nature of the physical representative. Knowledge being many, is the representative one or many? If one, how can it equally represent the many? If many, is it a cell, a fibre, a vibration, or a vibratiuncle? Again, if one, how is its reproductive activity differentiated? And if many, how are the many activities integrated? By differentiation and integration respectively perhaps.

5. There is need for some proof that the physical representatives are there. No doubt the cells and fibres of anatomy are there as phenomena, but what is needed is proof that they, or anything else, stands in the psychological relations assumed by this theory.

With these additions the theory might be made adequate; but at the same time it would be made worthless. The confusion and complexity of the doctrine have been unfolded at length in my work, *Introduction to Psychological Theory.*

The only sense in which the brain may be called the organ of memory is that in which the brain is the organ of thought. This does not mean that the brain does the remembering and thinking for the mind, or that the mind uses the brain to think or remember with; but only that thought and recollection are cerebrally conditioned. This simple fact of experience is made the occasion for the fantastic whimsies of the cerebral theory with the result of immensely increasing our difficulties without adding any insight.

In the Academy at Laputa, as reported by Gulliver, there

was great scientific research of a sort. But none of the investigations there undertaken equalled the vagaries of the cerebral theory of reproduction, consisting, as it does, mainly of improvised anatomy, fictitious psychology, and picture logic.

The synthetic or constructive psychology, with its implicit category of composition and mechanical combination, must be abandoned; and psychology must be largely descriptive and classificatory rather than explanatory in the causal sense. The description and classification of the mental facts, however, are important; and when the work is accurately done, it is much more valuable than fictitious explanations. The facts will remain mysterious in their inner ground and genesis, but they will be known as facts. And real mysteries are more valuable than unreal fictions, or sham knowledge.

It is important, however, that in the classification of the mental states we be ever on our guard against the fallacy of the universal. A vast amount of psychological literature has been made irrelevant or barren by this fallacy. The fancy has been held that in classifying the mental facts we come upon their true essence, or original from which they spring. Hence, if we class them all together, they are supposed to be unified and traced to a common source. This illusion has been discussed at length in the *Theory of Thought and Knowledge*. We there saw that classifying things does nothing to the things but leaves them all they ever were. We unify our thoughts or get a more convenient expression for many things, but the things remain as distinct as ever. And when we come to deal with the things as existing we have to pick up all concrete individual elements which we dropped out in the classification.

All that lies beyond this description and classification in

the way of explanation must be taken as we find it, or for what we can make out of it. There are sundry psychological laws revealed in experience, and by means of them we can get a kind of understanding of many facts, and can lay down various practical rules for the guidance of life. But this understanding, even when it is more than simple classification, must be psychologically, not mechanically, interpreted. That is, it must not be interpreted by some mechanical scheme of interacting forces which have a resultant in time, but it must rather be interpreted by our knowledge of human nature, or of the way in which the mind works. In the latter case it is not a mechanical resultant under some law of necessity, but rather the kind of thing which our psychological experience leads us to expect. How this kind of thing is possible may lie entirely beyond us, being as unanswerable as the question how being itself is possible; but as we find it given in experience, we practically build on it.

For instance, suppose a new interest or a new idea arising in the mind either of the individual or of the community. We get absolutely no insight by endowing the new idea with dynamic attractions and repulsions whereby it modifies other ideas and makes a place for itself. We may indeed use such language, but when we enter into ourselves we find it impossible to make out any tenable meaning. But by our general knowledge of human nature, and of the way in which the mind works, we are enabled to form some notion of what to expect. Or, after the fact has declared itself, we are able to assimilate it to our general knowledge of humanity so that it falls into line with the continuity of experience. This is the only explanation possible in the case, and the only one we ever get. Such insight as we possess into personal character, the social structure, the philosophy of history, is obtained in this way, and not from

a fictitious mechanism of ideas. Of course no one denies the laws which are actually found in experience. Protest is directed only against distorting these laws into a fictitious mechanical dynamism.

Understanding of this type is further complicated by the fact of freedom. We have to understand the action of a free being, and not the movements of an automaton, or the resultant of a mechanical combination. But here, too, something can be done, not in the way of mechanical deduction; but by combining our knowledge of the psychological constants with our general knowledge of the way in which men act, we can form some practical expectation for the future and get some idea of the way in which life and history hang together.

In estimating this result, two things must be borne in mind. The first is the emptiness of most general terms until they are illustrated in concrete reality. All terms which have to do with the actual remain bare forms until they receive their contents from experience. This is especially the case with the conscious life. Here the understanding forms and names a content which it does not generate, and which can be realized only in life itself. The understanding can name a certain feeling a sensation, a color sensation, a sensation of red, and can locate it in the category of quality; but all this is empty and formal without the original feeling. And when we are dealing with the latter, we see what a gulf there is between anything the understanding can express in its formulas and the actual experience. All warmth, richness, vividness, and immediacy are found in the living experience; and the logical form is only an instrument for its realization. Logic and epistemology give the general laws of thought and conditions of knowledge, and these are of great importance for the understanding of the thought life; but apart from these, scientific psychology has exceed-

ingly little value for the knowledge of the inner life or of human nature. It furnishes a terminology, but only scanty insight. It reduces the multiplicity of life to a few general heads, as thoughts, feelings, volitions. But what of it? These terms are vague and empty, until we return to life again. And when it comes to a real insight into life and human nature, a professional psychologist would be about the last man that could supply it. A novelist, a poet, a dramatist, a lawyer, a pettifogger, a stump-speaker, a society woman, a confidence man, might well have a knowledge of human nature beyond anything that all the psychologies in the world could furnish. This knowledge must be gained from the study of life and literature, and not from formal psychological treatises. One able lecturer on experimental psychology, indeed, in setting forth its advantages, urges all lawyers to take a course in the psychological laboratory for the sake of greater effectiveness with juries. And prophecies of good and great things to come from this line of investigation have abounded and still abound; but up to date there has been so alarming and distressing a tendency to elaborate the obvious and discover the familiar that one is compelled to discount the high expectations created by the advertisement.

The other thing to be borne in mind is the fact already often referred to, the impossibility of understanding the mental life in terms of anything but itself. There are no back-lying categories by which the mental life is to be tested, and through which it is to be understood. It is its own test and standard. The phenomenality of all mechanism and the relative and methodological nature of much mechanical reasoning must put us on our guard in this field against all theorizing which cannot be verified in living experience. And in any case, we may never view the mental mechanism as containing the productive causality of the mental life.

It is on this practical basis that human life and history are to be understood, so far as we can understand them. In this way it is possible to deal with the individual for practical purposes; and in this way we may get some insight into the philosophy of history. Not by fictitious mechanical constructions, nor by feigning unintelligible necessities, but by applying our knowledge of mental laws to the conditions of human life, we can get some idea of the unfolding of life and history as a function at once of human nature and of human freedom. To be sure this will not give us an "exact science," but it will give us all the science we are likely ever to have. The "exact science" in this region up to date consists mainly in flourishes about the reign of law. The rest is largely prophecy and advertisement; and these two are one.

The reign of law is an excellent phrase and represents an important fact, but we have to use it critically, not dogmatically. We must inquire what the laws are which reign, how they are to be understood, and what insight they furnish. Laws are to be interpreted in their own field and in accordance with their own subject matter, rather than by analogies borrowed from incommensurable departments. Until this is done we shall have ignorant and flighty persons giving mechanical interpretations of life and history, and setting forth that due reflection upon the instability of the homogeneous, or the conservation of energy, or the fact that motion is always along the line of least resistance, will find therein a complete solution of all our problems. But when we remember that there are laws and laws, and take the laws as we find them, we may hope for some practical insight, and in particular we may hope to be relieved from the mass of sham knowledge which now oppresses us. Any interpretation of phenomena which the facts themselves compel will always be accepted; but grave suspicion at-

taches to all deductions from abstract phrases, or from the reigning cosmological or biological speculation. When the fashion changes the old phrases lend themselves equally well to any other deduction whatever. For instance, any one inclining to write on the philosophy of history can reproduce the familiar contention that history is a science, that social phenomena are subject to law, and then naïvely assume that his lucubrations are thereby made science and law; and he will not be so far off from the beaten track.

Beyond the purely psychological laws lie the laws of logic. These are the great formal constants of thought; and they are independent of all mechanism. They admit of no dynamic expression or representation.

CHAPTER IV

FREEDOM AND NECESSITY

In the previous chapter we have discussed the notion of law and mechanism in mind. We have now to consider the general problem of freedom.

In popular thought the conviction of freedom manifests itself chiefly in connection with moral responsibility and executive moral activity; and the traditional argument for freedom consists in appealing to the sense of responsibility, and in pointing out that freedom is a manifest implication of this and other facts of our moral nature. This argument is by no means without weight. For common sense it is the chief argument; and for the critic who has got beyond the superficial dogmatism of mechanical thinking, the argument has no small value. In the study of various classes of facts we are not required to deal with them all in the same way, unless the facts themselves admit of it. Our fundamental obligation is to deal with the facts in accordance with their proper nature. If, then, in studying the facts of the physical world we are led to the assumption of an all-embracing uniformity of law, we may make that assumption for the physical system. But if in studying the facts of life, of conduct, of society, we find it necessary to assume, in connection with law, a factor of freedom, a power of choice and self-direction within certain limits, we have equal right to assume it. It is only a mind misled by false notions of continuity, and without a due appreciation of

logical method, which can take offence at such an assumption.

But this argument from moral experience is by no means the only one. The assumption of freedom has manifested itself again and again in our previous discussion as a necessary factor of rationality. There has been a very general conviction in speculative circles that the belief in freedom is an offence to reason. If we hold it at all it must be out of deference to moral interests, and at a very considerable sacrifice of our intellectual peace. How completely this inverts the truth has appeared in our previous discussion. It has there appeared that faith in reason itself is involved in freedom, and that the denial of freedom must lead to the collapse of reason. We purpose now to gather up these various considerations into a connected statement, in order that we may see at once the speculative importance and necessity of freedom, and also the superficial conception of the categories out of which the speculative objections to freedom spring.

By freedom in our human life we mean the power of self-direction, the power to form plans, purposes, ideals, and to work for their realization. We do not mean an abstract freedom existing by itself, but this power of self-direction in living men and women. Abstract freedom exists as little as abstract necessity. Actual freedom is realized only as one aspect of actual life; and it must always be discussed in its concrete significance.

A very large part of the discussion of this subject has been vitiated and often made void by failure to keep the concrete definition in view. Freedom has been abstracted as a function of the will without any light from intelligence, or impulse from desire. This is a fictitious problem, and, as such, can receive only fictitious solutions. At best it is a mathematics of imaginary quantities.

Actual freedom is no such fiction. It is the freedom of thinking and feeling human beings with some insight into values, and a complex body of practical interests; and this freedom means simply their power of self-direction within certain limits set by their own nature and the nature of things.

Such freedom is presupposed in every department of life. It is implicit in the assumption of responsibility on which society is built. The moral nature in both its mandatory and its retributive aspect is absurd without it. Moreover, this power seems to be involved in the very thought of a personal and rational life. A life of the Punch and Judy type, in which there is a deal of lively chattering and the appearance of strenuous action, yet without any real thought and effort, is not a personal or rational life at all. A life, also, in which consciousness is merely the stage on which underlying mechanical impulses masquerade is likewise no rational life. The purest illustration we have of self-direction is in the case of thinking itself. We direct and maintain attention, we criticise the successive steps of the argument, we look before and after, we think twice and reserve our decision. The process goes on within reason itself, reason supplying the motive, the norm, and the driving force. Thus life itself spontaneously takes on the form of freedom; and if freedom were an unquestioned fact it could hardly manifest itself more unambiguously than it seems to do now.

With this understanding of what freedom is we recur to its speculative significance. This appears first in its bearing on the problem of error. That problem lies in this fact: First, it is plain that unless our faculties are essentially truthful, there is an end to all trustworthy thinking. But, secondly, it is equally plain that a large part of thought and belief is erroneous. Hence the question arises, as a matter

of life or death for rational thought, how to reconcile the existence of error with faith in the essential truthfulness of our faculties. In discussing this problem in the *Theory of Thought and Knowledge* we saw that freedom is the only solution which does not wreck reason itself. In a scheme of necessity error becomes cosmic and necessary, and reason is overwhelmed in scepticism.

These considerations make it plain that the question of freedom enters intimately into the structure of reason itself. It is a question not merely of our executive activities in the outer world, but also of our inner rational activity. Hence the advantage of changing the venue from the court of ethics to the court of reason. In the former there is always room for speaking of the weight of motives, or of the stronger impulse, and thus we fail to get the clear illustration of freedom involved in the passionless operations of thought itself. There is the further advantage that every one practically allows this self-control in thought. We are able to think twice, to return upon the argument, to tear asunder the plausible and misleading conjunctions of habit and association, and to reserve our decision until the crystalline connection of reason has been reached. The necessitarian is impatient of bad logic in his opponent, calls upon him to clear up his thoughts, and wonders why he is so slow in drawing a manifest conclusion. Even the materialist, for whom thinking is but the mental shadow of certain nervous processes, expects logic, and to that extent attributes freedom. For there is no hesitation, no thinking twice, no reserving of judgment in an order of necessary movement. There might possibly be to an outside observer a mimicry of such hesitation; but the reality could not exist. In such an order the resultant is at once and irrevocably declared, as in the movement of a pair of scales. If we should make the grotesque assumption of a series of mechanical forces

endowed with consciousness, what possible meaning could we attach to their demands upon one another for logic, or to their mutual reproaches for failure to think clearly, or for failure to hold this, that, or the other view? Or if we suppose the scale-pans or their loads to become conscious, while remaining under the law of mechanical resultants, what meaning could be attached to their thinking twice and reserving their opinion as to which should sink or rise? Imagine a scale-pan debating whether to rise or fall, and finally deciding to follow the heavier weight. The farcical nature of the performance would be apparent to the dullest.

In the field of thought proper, every one, in spite of himself, assumes that reason is a self-controlling force. Freedom in thought cannot be rationally disputed without assuming it. Such is seen to be the real standing of the necessitarian argument as soon as we transfer the discussion to the field of thought. If, then, we were looking for the most important field of freedom we should certainly find it in the moral realm; but if we were seeking the purest illustration of freedom we should find it in the operations of pure thought. Here we have a self-directing activity which proceeds according to laws inherent in itself and to ideals generated by itself. And any one wishing to find his way into this problem of freedom will do well to consider first of all the relation of freedom to intelligence itself, and the collapse of rationality involved in the system of necessity.

Thus far on the significance of freedom in relation to the human subject. We next recall our conclusion that without assuming a free cause as the source of the outer world the mind is unable to satisfy its own rational nature or to bring any line of thought to an end. We found the conception of causality eluding us in the infinite regress and vanishing into the absolute flux, where thought perishes, until we raised the conception to the volitional form. We

also found that the search for unity and the desire for explanation and for the unification of the system of things in a common source are alike frustrated until we pass beyond the order of necessary and mechanical thinking, and rise to the conception of free intelligence as the source and abiding seat of all existence. As we need the conception of freedom in man for the solution of the problem of error, so we also need the conception of freedom as the source of the cosmos to make it amenable to the demands of our intelligence.

Freedom, then, has deep significance for life, for science, for philosophy, for reason itself. This significance will further appear if we next recall our conclusions respecting the opposite idea of necessity. This is commonly supposed to be clear and self-evident, while freedom is the difficult notion. This illusion is pretty sure to arise in the early stages of reflection; but deeper reflection dispels it. We have seen that the only clear conception we have of necessity is rational necessity; that is, the necessity which attaches to the relations of ideas, as in logic and mathematics. But this necessity is not found in experience, whether of the inner or the outer world. The elements of experience and their connections are all contingent, so far as rational necessity goes; that is, we cannot deduce them from ideas or connect them by any rational bond. The necessity, then, if there be any, is metaphysical; and this logic finds to be an exceedingly obscure notion, one which eludes any positive conception. It can be neither sensuously cognized nor rationally comprehended; and the more we wrestle with the idea the worse our puzzle becomes. In discussing the categories in the *Theory of Thought and Knowledge* we found it impossible to do anything with the notion without adding to it the further notion of potentiality; and what a necessary metaphysical potentiality might be we found it

hard to say. It must be in some sense an actuality, or it could never affect actuality; and yet it cannot be an actual actuality without antedating itself. We found ourselves driven, then, to distinguish two kinds of actuality, potential actuality and actual actuality, without, however, the least shadow of insight into the distinction between them. And in order to do this, we have to make causality temporal, which is impossible. Non-temporal necessity, on the other hand, would be motionless and would lead to nothing. Thus the doctrine of necessity finds itself in unstable equilibrium between the groundless becoming of Hume's doctrine, in which events succeed one another without any inner ground or connection, and a doctrine of freedom, in which the ground of connection and progress is to be found, not in any unmanageable metaphysical bond which defies all understanding, but in the ever-present freedom which posits events in a certain order, and thus forever administers all that we mean by the system of law, and founds all that we mean by the necessity in things.

The metaphysics of necessity is certainly very obscure, and it is even hard to keep the notion from vanishing under our hands. Mr. Mill felt so strongly both the difficulty of the notion and the lack of proof of any corresponding fact that he proposed to banish the term entirely from philosophy, and replace it by the empirical notion of uniformity. But this may be only the obscurity which attaches to all ultimate facts; and the metaphysics of freedom may be equally or more obnoxious to criticism. This indeed is very generally declared to be the case. The difficulties alleged consist mainly of misunderstandings.

And, first, it is supposed that freedom asserts pure lawlessness. This is a closet contention. It is not born of any observation of life and experience, or of any profound reflection, but only of a verbal exegesis. Freedom every-

where presupposes a basis of fixity or uniformity to give it any meaning. An absolute freedom, unconditioned by any law whatever, is simply our old friend pure being, and cancels itself. Even for the absolute being, we must affirm a fixed nature as the condition of freedom; and without this, thought perishes.

Now to the superficial thinker and dealer in abstractions this smacks of contradiction; and so it must as long as we discuss the question abstractly. The abstract notion of freedom and the abstract notion of necessity are contradictory; just as the abstract notions of concavity and convexity are contradictory. But as the latter notions, though contradictory, do yet contrive to coexist, so successfully indeed that they cannot exist apart, so it may be that the other contradictions may be reconciled in reality. We must then look away from the abstract notions to the concrete facts, if we would get any light on this problem. There is no abstract freedom and no abstract necessity. We are thrown back upon experience to discover what the facts really are.

And here we find a certain measure of self-control and a certain order of uniformity. The former represents the only concrete notion of freedom which we possess; and the latter represents the only concrete notion of necessity. Anything beyond this is abstract and fictitious. There is nothing in experience corresponding to it; and when we get into these depths experience is our only test both of reality and of possibility. And we not only find these elements given in experience, but we find them so given that reality appears inconceivable and impossible without both, just as concavity and convexity must be united in any real curve.

The clearest illustration of this we find in thought itself. The laws of thought represent absolute fixities of mental procedure. They are the constants of the mental equation,

without variableness or shadow of turning. They represent no legislation of the will, and admit of no abrogation or rebellion. And yet, though thus secure from all tampering and overthrow, though thus existing in their own inalienable right, they do not of themselves secure obedience. For this there is needed an act of ratification by the free spirit. The mind must accept these laws and govern itself in accordance with them. It must watch itself, scrutinize its processes, tear asunder the associations of habit and resist the hasty generalization, if it would reach the truth. Only thus do we become truly rational, and that by our own free act. Thus we discover freedom and uniformity united in reality; or rather we discover reality as having these opposite aspects. It is not compounded of them, as if they pre-existed, but it manifests itself in this antithetic way.

Now if we should discuss this question academically, or with abstract notions, it would admit of no solution. We should be in the same plight as when discussing the union of unity and plurality, or simplicity and variety, or change and identity. We found that the mere analysis of these notions led to nothing. We had to fall back on experience which showed us the ideas actually united in our concrete intellectual life. And we further found that we have no other conception of the concrete meaning of these ideas than that which we get from the study of our mental experience.

In any case, then, the assertion that freedom means lawlessness is mistaken. An element of uniformity must always be allied with freedom even in the absolute being. At the same time we have seen that this element becomes controlling only through freedom.

For us human beings this element of fixity is very prominent. To a great extent we are a datum for ourselves.

The essential nature of our susceptibilities and constitutional activities is beyond our control. So also are the laws of thought and association, and the general laws of nature. We may use these laws for the attainment of our ends, but we cannot make or unmake them. We are also members of a system of law; and the demands which this system makes upon us are something we cannot escape. The world of sensation and the resulting desires and attention and reflex action are only to a slight extent within our power. We are shut in on many sides by walls of hewn stone.

Hence human freedom has only a limited sphere. It does not provide the laws of the intellect, of the sensibilities, of external nature, or the possibility of its own action. And within its own sphere it is far from absolute. Only a certain intensity of activity seems possible to it in given circumstances; and when the resistance to be overcome is too great freedom is overborne. Of course the speculator of the all-or-none type will take offence at this notion. It will be equally objectionable to those who insist on sharply drawn frontiers. But both of these classes belong to the family of Unwisdom.

This general conception of freedom vacates a set of objections drawn from the postulates of science. Science, it is said, assumes the uniformity of law, and thus excludes freedom. Science assumes that under like circumstances there must be the same result. Freedom assumes that under like circumstances there may be a different result. The opposition is absolute and admits of no mediation. For mental science Mr. Spencer, in his *Principles of Psychology*, puts the matter very trenchantly: "Psychical changes either conform to law or they do not. If they do not conform to law, this work, in common with all works on the subject, is sheer nonsense. If they do conform to law there cannot be any such thing as free-will."

This is peremptory; and thus we seem to be landed in a very grievous antinomy. On the one hand, a system of necessity destroys reason, and, on the other hand, the admission of freedom is fatal to science. Fortunately the antinomy disappears on noting the purely abstract and verbal character of the objection. It tacitly assumes that freedom means pure lawlessness, whereas our freedom presupposes the order of law as its condition. Freedom uses this order, and science studies this order. Science concerns itself with the modes of being and happening among things and events; and their existence and nature are in no way affected by the question of freedom. The forms and laws of sensibility, the laws and categories of intelligence are not involved in freedom; and, whether we affirm or deny freedom, these laws and forms exist as the proper subject of psychological study. The belief in freedom vacates the science of psychology just as much and just as little as it vacates the science of physics and chemistry. In both the physical and the mental realm the believer in freedom finds an agent acting in accordance with an order of law and, by means of that order, freely realizing his own aims. Freedom, then, is not opposed to physics, or chemistry, or psychology, or any other modest science which studies the laws of things and events, but only to "Science"—that is, that speculative dream which aims to bind up all things in a scheme of necessity; and this, so far from being science is simply one of those uncritical whimseys of which the dogmatic intellect has ever been so prolific. Indeed, this scheme is so far from being science that it is rather the destruction of all science and of reason itself.

The heavy speculative objections to freedom are drawn from the supposed demands of the law of causation. But these also rest upon a misunderstanding of both freedom and causation. Freedom is ascribed to the will; and the

will is abstracted from feeling and intelligence. Thus freedom is reduced to blind and lawless arbitrariness, and loses its value. But this fiction results from mistaking the abstractions of psychology for separate and mutually indifferent factors. Fortunately, psychology has got beyond this. If anything is free it is not the will, but the knowing and feeling soul; and this soul determines itself not in the dark of ignorance, or in the indifference of emotionless and valueless life, but in the light of knowledge and with experience of life's values. Such self-directing activity does not violate the law of causation. That law tells us only to seek an agent for every act, but it does not tell us what the agent must be. So far as the law goes, a self-directing cause is at least as possible as any other; and it is the only cause of which we have experience. Without any deep speculation, the question of free causality is simply one of fact, so far as the law of causation is concerned; and when we look into the matter critically, it turns out that the notion of causation itself vanishes unless we raise it to the volitional form. Of course we cannot tell how a free agent is made or is possible; but still less can we tell how a necessary agent is made or is possible. But though we cannot tell how a free agent is possible, we have some experience of it as actual; while we not only have no experience of necessary agency, but the idea itself is elusive to the last degree, vanishing finally either into a groundless becoming, on the one hand, or into the infinite regress, on the other, and in both cases contradicting itself.

Another quotation from an able writer may be given as an illustration of the abstract method of viewing this question: "If volitions arise without cause, it necessarily follows that we cannot infer from them the character of the antecedent states of feeling. If therefore a murder has been committed, we have *apriori* no better reason for suspecting

the worst enemy than the best friend of the murdered man. If we see a man jump from a fourth-story window, we must beware of too hastily inferring his insanity, since he may be merely exercising his free-will; the intense love of life being, as it seems, unconnected with attempts at suicide or at self-preservation. We can thus frame no theory of human actions whatever. The countless empirical maxims of every-day life, the embodiment as they are of the inherited and organized sagacity of many generations, become wholly incompetent to guide us; and nothing which any one may do ought ever to occasion surprise. The mother may strangle her first-born child, the miser may cast his long-treasured gold into the sea, the sculptor may break in pieces his lately finished statue, in the presence of no other feelings than those which before led them to cherish, to hoard, and to create."

As the same author elsewhere says, "Verily the free-will question is a great opener of the flood-gates of rhetoric." This is more abstract closet logic. Freedom, taken absolutely and verbally exegeted, would imply the abstract possibility of all this; but this has no connection with the concrete problem. Suppose there were a free person with experience of life's meanings and insight into its values and obligations, there is nothing in his freedom to hinder his acting rationally, or to excuse him for acting irrationally. But how he will act does not find its sufficient ground in the "antecedent phenomena" alone, but also in the mystery of self-determination. And this is something which cannot be mechanically analyzed, or deduced as a necessary resultant; it can only be experienced. The attempt to analyze it contradicts it. The attempt to construct it denies it. It can only be recognized as the central factor of personality, the condition of responsibility, and the basis of the moral life. Criticism cannot hope to construe it; it can

only point it out as a fact, and show that the objections to it rest on an imperfect understanding of thought itself. In particular, criticism, while it justifies the search for a ground, points out that only free and active intelligence can be a ground in which thought can rest. The notion of a bound will, which has often appeared in theology, is either a confusion of limitation of will with the denial of freedom, or else it is an application of the law of the sufficient reason beyond its field. Finally, criticism points out that the necessitarian doctrine in general rests on the fancy that mind may be understood as the result of its own consequences.

There is, however, in the uncritical dream of the necessitarian an implicit speculative aim which deserves consideration. This is based on the desire for totality and systematic completeness. There is an unwillingness to leave anything unrelated and uncomprehended. Hence the ever-recurring fancy that, if we knew all, we should find everything bound up in a rigid and all-comprehending system. But this aim, which is a legitimate one, is thwarted by a profound ignorance of the conditions of its own attainment. Hence the thought to find the systematic totality in a metaphysical necessity of the mechanical type. The impossibility of this we have already seen. Such totality can exist only in and through intelligence.

But in our revolt against necessity we must be on our guard against the opposite abyss of lawless caprice. A world in which events fall out by chance and haphazard is also intolerable to intelligence. And the fancy that this is the only alternative to necessity has been one great support of the latter doctrine. As long as this fancy is held the mind must vacillate between the two extremes, being driven out from either as soon as it grasps its implications. The only way out lies in carrying everything back to intelligence, while resolutely eschewing every attempt to com-

prehend intelligence as the result of its own categories, or to do anything with it but experience and use it.

In the case of the world we can get on only as we carry all things back to the notion of the absolute intelligence who is working a rational work in accordance with a rational plan. In this plan everything will have its place and function, and will be comprehended in an all-embracing purpose. In this work we shall have no unintelligible metaphysical necessities called laws, but rather uniformities of procedure which are freely chosen with reference to the plan. At the same time we shall have no lawless and chance events, as all will arise in accordance with the purpose of the whole. Metaphysical necessity in the world must be replaced in our thought by the conception of uniformity administered by freedom for the attainment of rational ends. Here in the unity of the free Creator, in the unity of his plan, and in his ever-working will is the only place where the world has unity, completeness, and systematic connection. Any necessity other than this is found in our relation to the uniformities of the system and is relative to ourselves. We call it necessary because, so far as we are concerned, it is fixed.

But as this plan is very imperfectly known to us, criticism warns us against erecting even the phenomenal uniformities into an absolute system, whether in the inner or the outward world. In the physical world we must take the phenomenal uniformities for what we can make of them, and regard all our theoretical machinery as only a series of devices for representing the facts, the value of which is to be found entirely in their practical convenience, and not at all in any speculative insight which they furnish. And when we are tempted to extend them through infinite space and time, we should do well to limit them to a "reasonable degree of extension to adjacent cases." In the inner world,

as pointed out in the last chapter, we must not interpret our laws by any physical analogies, but take them as we find them given in experience. And the explanations in this field must also be carried on without subordinating them to physical images and mechanical science. They must be constructed psychologically, not physically; and their value will consist not in a deduction of life and history from the antecedent phenomena, considered as component forces, but rather in our insight into the facts on the basis of our knowledge of the way in which living men think and feel and act. This insight is purely *sui generis*, and is only darkened when construed in mechanical terms. In this way a valuable practical insight into human affairs is possible, an insight which would be profitable for doctrine, for reproof, for correction, and for instruction; but this insight will never be gained until we construe human life on its own basis as a life of freedom as well as of law, as a life of reason as well of association, as an ethical life as well as a life of sense; and until this great cloud of physical metaphors and analogies which has overshadowed and darkened psychology shall be dispersed again into its native nothingness.

Thus we have discussed the fundamental notions which mark the outlines of psychological study. The great weakness of this science at present is that investigators commonly have no consistent conceptions on these points, and interpret their facts by a grotesque or impossible metaphysics. Often enough, the more naïve mistake their metaphysical and rhetorical imaginings for the mental facts themselves. And there will be no progress in the science, until we have brought forth fruits meet for repentance. We must discern the unique and incommensurable character of the mental facts, and interpret them in accordance with their own

proper nature. We must also discern the complete futility of all mechanical and necessitarian reasoning in this field, and note its origin in a superficial conception of thought and its categories. Then the mythology which has so long infested this field will be put away; and psychology will at last become a sane and sober science.

CONCLUSION

After wandering so far and wide through dry places, we sum up the results of our work by calling attention to some leading points which we conceive to have special significance for the progress of speculation.

The first point is the impossibility of construing the mind as the resultant of the interaction of any number of physical or impersonal elements. Along with this goes the parallel conviction of the impossibility of constructing thought by any mechanical juxtaposition or associational union of particular mental states, arising in or through the nerves, or representing simple affections of a passive sensibility. The failure of this view is complete, and philosophy is rapidly coming to the recognition of the fact.

The result is that thought is to be viewed as an organic activity, unfolding organically from within and not mechanically put together from without. And from this it further results that knowledge can never be a passive reflection of an existing order, still less can it be a passive reception of ready-made knowledge from without. It must rather be viewed as an active construction of the object within and for our thought and by our thought itself.

In the *Theory of Thought and Knowledge* the formal nature of the categories as immanent principles of intelligence has been set forth. In the present volume we have sought to fix their concrete significance, and we have come upon many surprises. It seemed at first that the categories

are principles of reality, and that reality must be understood through them; but it soon became clear that only phenomenal reality can be thus understood. Reality for intelligence is intelligible in the forms of intelligence. But in popular thought there is always supposed to be reality beyond intelligence and independent of it. This is just real and exists on its own account. Intelligence may possibly know it, but intelligence has at present nothing to do with its existence.

This conception of an extra-mental reality, external to all consciousness and in antithesis to all consciousness, represents the deepest and dearest conviction of common-sense realism. We have learned how it arises. It is partly due to the conviction, which no one questions, that our thought grasps an order which it does not make but finds. This independence of our thought is mistaken for an independence of all thought; and crude realism results. The illusion further rests on the failure to distinguish between the phenomenal and the ontological reality. Common-sense unhesitatingly takes phenomena for substantial realities, and takes the phenomenal categories as the deepest facts of real existence. In this way it builds up a mechanical and material system which often proves a veritable Frankenstein for its creator.

But when we came to study this extra-mental reality we found it extremely elusive, and finally we discovered it to be no less illusive. The various categories whereby realistic thought constructs reality proved to be simply the bare forms of intelligence, projected beyond intelligence, and thereby made meaningless. Being, causality, unity, identity turned out to be unintelligible and impossible apart from intelligence. It finally appeared that the world of things can be defined and understood only as we give up the notion of an extra-mental reality altogether, and make

the entire world a thought world; that is, a world that exists only through and in relation to intelligence. Mind is the only ontological reality. Ideas have only conceptual reality. Ideas energized by will have phenomenal reality. Besides these realities there is no other.

This is what is called my idealism—a name for which I have no special liking or dislike, provided the thing be understood. Historically, it might be described as Kantianized Berkeleianism. In itself it might be called phenomenalism, as indicating that the outer world has only phenomenal reality. It might also be called objective idealism, as emphasizing the independence of the object of individual subjectivity. It is idealism, as denying all extra-mental existence and making the world of objective experience a thought world which would have neither meaning nor possibility apart from intelligence. And this is the conception to which speculative thought is fast coming. From all sides thought is seen to be converging upon this conviction, as the only one which makes thought possible. In this view the world-old conflict of the Eleatic and Heraclitic factors of thought is brought to an end. The almost equally old antithesis of realism and nominalism finds here its only possible mediation. The mechanical and materialistic view finds a recognition of its phenomenal truth, together with an escape from its essential error. It makes some intelligible provision for rational law, system, science, philosophy, morals, and religion, which can hardly be said to be the case with the traditional realistic view when unfolded into its consequences.

In our study of the categories we have made another discovery, namely, that they are either purely formal, and hence phenomenal, or else that they admit of being truly conceived only in the forms of living experience. Here we come upon what may be called a transcendental empiricism,

in distinction from the traditional sense empiricism. That is, instead of testing our fundamental experience by the categories, we must rather find the meaning of the categories in experience. This experience, however, is not the passive experience of sense, but the active self-experience of intelligence.

We come here into contact with one of Kant's obscure doctrines, the schematism of the categories. Kant pointed out that the categories, abstractly taken, do not admit of being properly conceived. They must be applied to a given sense matter, or else the understanding must be helped by some representation borrowed from intuition. When both elements are lacking, there is really no conception, but only a mental vacuum. Kant found the mediating representation in the temporal intuition, and out of this he evolved the schematism of the categories. A schema is a temporal representation whereby the corresponding category is made apprehensible by intelligence. Thus the schema of reality is time full; that of negation is time empty. The schema of causality is antecedence and sequence. Possibility, impossibility, and necessity are represented by sometime, never, and ever.

In all of this Kant was on the right track, but he had not thought through. The categories, conceived as impersonal abstractions, do defy all conception; but Kant's schematism does not help the matter. The temporal form does not help us to any real conception. No reflection on temporal antecedence and sequence will assist us in conceiving causation. And the case of the categories is really worse than Kant represented; for when abstractly taken, they not only defy conception, but they contradict themselves; and they continue to do so until they are brought out of their abstraction and are looked upon as modes of intellectual manifestation. As we have so often said, intelligence

cannot be understood through the categories, but the categories must be understood through our living experience of intelligence itself. Intelligence is and acts. This is the deepest fact. It is not subject to any laws beyond itself, nor to any abstract principles within itself. Living, acting intelligence is the source of all truth and reality, and is its own and only standard. And all the categories, as abstract principles, instead of being the components of the mental life, are simply shadows of that life, and find in that life their only realization. This may be called my transcendental empiricism.

Something of the same kind must be said concerning the general problem of knowledge. The relation of subject and object in knowledge is absolutely unique. As we have said in discussing space, it admits of no spatial or other representation, and can only be experienced. The mind on the sense plane attempts to conceive the relation in space terms. The subject and object stand over against each other in space, and thus the matter is cleared up, especially as the subject is easily confounded with the physical organism. This is one body among other bodies; and when other bodies act upon it, what is this but an affection of the subject by the object; and what can this affection be but knowledge? Of course this is infantile from a speculative stand-point; but, when we put it away, there vanishes the last possibility of representing the relation of knowledge in terms of anything but itself. This becomes still clearer when we reflect on the phenomenalism of spatial existence. As long as we had an identical and common object in a common space, to which all might have free access for the sake of rectifying and justifying their ideas, we could form some conception of the possibility of knowledge. But when both space and the object become phenomenal, and when the community of the object becomes only the apprehension

of a thought content valid for all, and when, finally, this thought content retreats from space and time into unpicturable dependence on the infinite intelligence and will, we are utterly beyond all possibility of representation. Our earlier contention that knowledge arises in the mind only through its own activity remains unshaken and unshakable; but if we try to explain knowledge in its essential nature, or to justify it by anything beyond itself, we soon find the task hopeless. After theory has exhausted its resources, there are deeps in the problem of knowledge which recall Jacobi's claim that all knowing involves revelation. In any case knowledge must finally be its own standard; and in the deepest things we must be content with knowing not how we know, but that we know.

In discussing the problem of apriorism and empiricism in the *Theory of Thought and Knowledge* we discovered that they both leave a very important question unanswered; namely, Can the nature of things be practically trusted? And we also discovered that no answer can be found in the field of the speculative reason. This conviction becomes more emphatic as the result of metaphysical analysis. A great deal of our knowledge has been restricted to phenomenal validity, and has been found to be very superficial even there. In addition, much apparent knowledge has been seen to be purely relative to our human stand-point and without any claim to proper universality. Our speculative assurance is mainly formal, and it gives very little security for the concrete order. Our convictions here must be practical rather than speculative, and they must be held for what they are practically worth, and not as speculative principles. Our faith in them must rest upon their practical necessity, and possibly upon some conviction of an ethical and æsthetic nature. In any case, logic admonishes us to be very wary of them when carried

beyond the reasonable degree of extension to adjacent cases.

This sounds something like Kant's practical reason; and in some respects it is identical with it. It is reached, however, in a different way. The conclusion rests on no scepticism of reason, but on reason's own testimony concerning itself. The crude dogmatist knows a deal more than he has a right to know; and when he is cross-questioned the illusion appears. Our reason is not contradictory, but limited; and the limitation appears on examination. And when knowledge fails, we have to fall back on belief based on the necessities or the intimations of practical life. Here the test of truth is not speculative insight, but practical necessity or practical absurdity. And truth of this sort must never be mistaken for a speculative principle, but only for a practical postulate.

Finally, we emphasize the futility of all attempts at philosophizing on the plane of impersonal existence. On that plane thought is blocked in every direction. If we seek for explanation we never find it. Things themselves are dissolved away into elusive phantoms. The law of the sufficient reason shuts us up to the infinite regress. We cannot deduce motion from the motionless, or change from the changeless; and thus we remain in the eternal flow. On the other hand, it is equally clear that thought can take no step without some strictly changeless and abiding existence. Here is an antinomy almost as old as speculation, which is commonly ignored, but rarely removed. The most favorite device is to carry the change and changelessness into one being, and to suppose that in some way the unity of this being would hold the increments of change together and bridge over the contradiction. But this device we have seen to be a failure. And all impersonal devices are failures. Thought remains in deadlock here until we carry the prob-

lem up to the plane of free intelligence, and find in thought the source of both change and identity, of unity and plurality, and of all outgo whatsoever. This is the deep speculative significance of freedom.

It results from this that all explanation lies within the sphere of the products of thought, and must not be extended to thought itself. We explain the work of intelligence by tracing it to intelligence, but intelligence itself simply is. It accounts for everything else, but it accepts itself. When we seek to construe intelligence in any way we fall into illusion. Component factors, antecedent mechanism are fictions of unclear thought. When we come to intelligence we must stop in our regress and understand it as intelligence. Here our transcendental empiricism again appears. Intelligence has no means of understanding itself as product. It is the source of all products, and for knowledge of itself it must fall back on experience.

Persons who follow blindly the law of the sufficient reason, something as children who ask, Who made God? may possibly object that in this case there is a gulf between thought and its products; and they would like to be able to trace the product into thought itself, and then trace it out again. For the complete satisfaction of reason the road between the creator and the created must admit of being travelled in both directions. But this too is illusory. Of course we must suppose intelligence to be intelligence, and hence to know what it is doing and why it does it; but in no other sense can we trace the product into intelligence. For the rest, the only gulf in the case is that between the agent and the act, the doer and the deed. We may trace the deed to the doer, but to trace it into the doer involves confusion and nonsense. The producer is not the work, but he is revealed through the work; and the work is understood through the producer. This is a relation which is

perfectly intelligible in experience; and beyond it we cannot go. When we seek to construe the back-lying intelligence we have no guide but experience, and this does not take us far even in our own case. When we turn the contents of the infinite consciousness into a kind of eternal and necessary logical mechanism we simply fall back to the lower mechanical categories which thought alone makes possible, and subject thought to its own implications and products. Such a view begins in confusion and ends in self-destruction.

Herewith our work ends. According to an Oriental proverb, God knows it better. Without recurring to this high consideration, we may well believe that a great many younger and brighter minds also know it very much better. Yet so it seems to me; and I have set it down in the hope that so it may seem to others also.

THE END

Text-Books in Chemistry

STORER AND LINDSAY'S ELEMENTARY MANUAL OF CHEMISTRY. $1 20

A standard manual for secondary schools and colleges. This text-book is a thorough revision of Eliot, Storer, and Nichol's Elementary Manual of Chemistry, rewritten and enlarged to represent the present condition of chemical knowledge, and to meet the demands for a class book on Chemistry, at once scientific and clear in method. It presents the leading facts and theories of the science in such a simple and concise manner that they may be readily understood and applied by the student.

CLARKE'S ELEMENTS OF CHEMISTRY $1 20

A scientific book for high schools and colleges intended to provide a complete course for schools and to serve as a substantial basis for further study.

COOLEY'S NEW TEXT-BOOK OF CHEMISTRY . . 90 cents

An elementary course designed for use in high schools and academies. The fundamental facts and principles are treated in a simple, concise, and accurate manner.

STEELE'S POPULAR CHEMISTRY $1 00

A popular treatise for schools and private students in which the study is made interesting as well as instructive by the clearness and simplicity of the treatment.

BREWSTER'S FIRST BOOK OF CHEMISTRY . . 66 cents

Designed to serve as a guide for beginners in the simplest preliminary chemical operations. The experiments are of the most elementary character, and only the simplest apparatus is employed.

Laboratory Methods

ARMSTRONG AND NORTON'S LABORATORY MANUAL OF CHEMISTRY . . . . . 50 cents

COOLEY'S LABORATORY STUDIES IN CHEMISTRY . 50 cents

KEISER'S LABORATORY WORK IN CHEMISTRY . . 50 cents

IRISH'S QUALITATIVE ANALYSIS FOR SECONDARY SCHOOLS . . . . . 50 cents

STODDARD'S OUTLINES OF QUALITATIVE ANALYSIS . 75 cents

Copies will be sent, prepaid, to any address on receipt of the price.

American Book Company

New York • Cincinnati • Chicago

Cooley's Student's Manual of Physics

FOR THE STUDY-ROOM AND LABORATORY

By LEROY C. COOLEY, Ph.D.
Professor of Physics in Vassar College

Cloth, 12mo, 448 pages Fully Illustrated. Price, $1.00

The Student's Manual of Physics is designed as a text-book for High Schools, Academies, and Colleges. It embodies a full and clear exposition of elementary principles, including the results of the latest investigations in the field of physical science. The leading feature of the book is its coördination of oral instruction, text-book study, and laboratory practice. It follows the course outlined by the Committee of Ten as to the methods to be pursued in the study and the time to be devoted to each kind of work. The laboratory work is designed to occupy more than half the student's time, a sufficient number of carefully selected experiments being given for that purpose. The experiments have been chosen with great care, and are such as will cultivate a scientific spirit and lead to a thorough comprehension of the subject.

Copies sent, prepaid, to any address on receipt of the price

American Book Company

New York • Cincinnati • Chicago

VICTORIA UNIVERSITY
LIBRARY

DO NOT REMOVE THIS CARD